Exhibit No. T-____(CWK-T)
UT-961632

DIRECT TESTIMONY OF
CHARLES W. KING

Q. Please state your name, position and business address.

A. My name is Charles W. King. I am President of the economic consulting firm of Snavely King Majoros O'Connor & Lee, Inc. ("Snavely King"). My business address is 1220 L Street, N.W., Suite 410, Washington, D.C. 20005.

Q. Please describe Snavely King.

A. Snavely King, formerly Snavely, King & Associates, Inc., was founded in 1970 to conduct research on a consulting basis into the rates, revenues, costs and economic performance of regulated firms and industries. The firm has a professional staff of 16 economists, accountants, engineers and cost analysts. Most of its work involves the development, preparation and presentation of expert witness testimony before Federal and State regulatory agencies. Over the course of its 26 year history, members of the firm have participated in over 500 proceedings before almost all of the state commissions and all Federal commissions that regulate utilities or transportation industries.

Q. Have you prepared a summary of your qualifications and experience?

A. Yes. Attachment 1 is a summary of my qualifications and experience.

Q. Have you prepared a summary of your specific experience in the field of depreciation and capital recovery?

A. Yes. Attachment 2 is a brief summary of my experience with respect to depreciation.

Q. Have you previously submitted testimony in regulatory proceedings?

A. Yes. Attachment 3 is a tabulation of my appearances as an expert witness before state and federal regulatory agencies.

Q. For whom are you appearing in this proceeding?

I am appearing on behalf of the Section of the Washington Office of the Attorney General and Public Counsel of the State of Washington and on behalf of Telecommunications Ratepayers for Cost-Effective and Equitable Rates ("TRACER").

Q. Was this testimony prepared by you or under your direct supervision?

A. Yes, it was.

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to respond to the testimony and exhibits presented by GTE Northwest Incorporated ("GTE") in support of proposed reductions in service lives to be used in the calculation of the depreciation rates for eight plant accounts:

2212.0 Digital Switching Equipment
2232.0 Circuit Equipment
2421.1 Aerial Cable Metallic
2421.2 Aerial Cable Non-metallic
2422.1 Underground Cable Metallic
2422.2 Underground Cable Non-metallic
2423.1 Buried Cable Metallic
2423.2 Buried Cable Non-metallic

I will offer my views as to the appropriate service lives for these accounts.

Q. What service lives does GTE propose for these accounts?

A. The current and proposed service lives for these eight accounts are as follows:

			Service Life (Years) Current	GTE Proposed
2212.0	Digital Switching Equipment	16.5	10.0	
2232.0	Circuit Equipment		12.0	8.0
2421.1	Aerial Cable Metallic	21.0	15.0	
2421.2	Aerial Cable Non-metallic		30.0	20.0
2422.1	Underground Cable Metallic	26.0	15.0	
2422.2	Underground Cable Non-metallic		30.0	20.0
2423.1	Buried Cable Metallic		23.0	15.0
2423.2	Buried Cable Non-metallic		30.0	20.0

Q. Please describe the testimony and exhibits submitted by GTE.

A. GTE has submitted testimony by Allen E. Sovereign and Lawrence K. Vanston. Mr. Sovereign makes three points: first, that mortality analysis used in the traditional historical methodology for developing depreciation rates is outdated and inappropriate; second, that the changing telecommunications environment must be considered when determining the proper recovery period of an asset; and third, that GTE's proposed depreciation rates are not reasonable when compared to unregulated telecommunications providers.

Dr. Vanston describes the derivation of the depreciation rates proposed by GTE, specifically the Fisher-Pry model of substitution analysis. This model charts the S shaped curve by which new technologies are introduced and old technologies are retired. Dr. Vanston also discusses the technological changes and the competitive developments which he believes impact on depreciation lives. He then introduced the studies by his firm, Technology Futures, Inc.("TFI"). There are two studies attached to Dr. Vanston's testimony, one that purports to reflect GTE-specific -- although not GTE Washington-specific -- experience, the other which is a general

industry-wide study performed in 1995. These studies describe in somewhat more detail the substitution analysis discussed by Dr. Vanston in his testimony. They also provide recommended remaining lives and total service lives.

The industry-wide TFI study, which is Attachment 2 to Dr. Vanston's testimony is an update of a somewhat more detailed 1994 study titled "Transforming the Local Exchange Network."

Q. At page 3 of his testimony, Mr. Sovereign draws a distinction between the "useful life" or the "economic life" of an asset and the amount of time it remains on the Company's books. Is this a relevant distinction?

A. No. Under present accounting rules, a utility continues to depreciate assets as long as they are on the books. There is no allowance for discontinuing depreciation once the "useful life" of the plant has been exhausted. Nor is there any provision for reducing or eliminating the depreciation of underutilized assets, as Mr. Sovereign implies.

In response to a data request, GTE stated that it proposes to change depreciation expense for plant that is beyond its useful life but still on the regulatory books. To my knowledge, however, no formal proposal has been made, and until it is, the Commission must set depreciation lives on the basis of the present accounting procedures. This means that depreciation lives should correspond to the time that the plant will continue to be carried as an asset on the regulatory books of the Company.

Q. Is there any indication that GTE is maintaining very underutilized plant on its books,

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Response to Public Counsel data request no. 111.

as Mr. Sovereign implies?

A. No. GTE was asked to provide "fill factors" for certain classes of plant alleged to be subject to obsolescence, but the Company indicated that it did not maintain such data. In response to a request for the fill factors used in the Company's total element long run incremental cost studies, GTE's response was that this information "is not reasonably calculated to lead to discovery of admissible evidence and is not relevant to the calculation of depreciable lives for GTE Northwest."

Q. Turning to Mr. Sovereign's first point, will you describe "traditional mortality analysis?"

A. Traditional mortality analysis draws on the history of recent retirements to estimate the probable pattern and timing of future retirements. The date of placement of the individual units of most categories of telephone plant is recorded in the continuing property records of the company. When the plant is retired, the company therefore knows the age of each unit of plant. The company can perform an "actuarial" study to identify the average age of retiring plant, as well as the distribution of that plant among the "vintages" of placement.

Q. What is the value of traditional mortality analysis?

A. If there is reason to believe that future retirements will follow the patterns of recent retirements, then traditional mortality analysis is a useful guide to setting

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Response to Public Counsel data request no. 122.

On May 28, the Company did indicate that these fill factors can be found in the testimony of its witness David Turek in WUTC Docket Nos. 960369,-70 and -71.

depreciation lives. It provides not only a quantification of the average life of retiring plant, but it permits an estimate of the dispersion of retirements around that average. This dispersion information is critical to certain forms of depreciation, notably the Equal Life Group depreciation applicable to all new vintages of GTE plant.

Whether traditional mortality analysis is irrelevant in the current environment, as Mr. Sovereign claims, is a function of the extent to which the future retirement patterns of GTE's plant will resemble those of the past. That, in turn, depends on the reliability of the statements of Mr. Sovereign and Dr. Vanston regarding the likely effect of new technology and competition.

Q. Do you have traditional mortality studies available for the eight GTE accounts at issue in this proceeding?

A. The only traditional mortality studies I have available are those submitted by GTE in its 1991 and 1994 depreciation represcriptions. The latest year for which data are available in these studies is 1993. The Company has been requested to provide mortality studies through 1996 but has declined to do so.

Q. What role do these witnesses see being played by new technology?

A. Both witnesses emphasize that new technological developments will hasten the retirement of existing plant and will reduce the service lives of the major plant accounts relative to that indicated by past mortality studies. Dr. Vanston's report cites specifically (1) the replacement of copper cable with fiber for virtually all applications, including the local loop; (2) Asynchronous Transfer Mode ("ATM")

Response to WUTC Staff data request no. 4.

switching, which will replace much of the digital switching plant; (3) Synchronous Optical Network ("SONET") which will cause retirement of existing circuit equipment; and (4) digital wireless technologies, such as Time Division Multiple Access and Code Division Multiple Access, which increase the capacity of cellular telephone systems.

Q. How relevant are these technological developments to GTE's Washington operations?

A. They appear to have relatively little relevance. In response to data requests, GTE stated that it has no plans to deploy fiber in the loop or ATM switching. It has deployed SONET for interoffice facilities since 1993, but it has no forecast of the consequent retirements of circuit equipment.

GTE does not offer cellular service, although its affiliates do, so the reference to cellular technologies is of questionable relevance. Given that the average monthly bill in 1996 for local cellular service was $47.70, it would appear that this service is a long way from being price competitive with landline local exchange telephone service.

Q. Are there any technologies that might lengthen the lives of the plant accounts at issue in this proceeding?

A. Yes. A technology called Asymmetric Digital Subscriber Line ("ADSL") allows a

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Responses to Public Counsel data request nos. 113 and 115.

Response to Public Counsel data request no. 114.

Cellular Telephone Industry Association, Semi-annual Data Survey Results, Release of March 3, 1997.

conventional wire pair loop to carry data speeds up to 8 Mbps, the equivalent of several television signals (with digital compression). This technology might allow the telephone industry to offer high speed data, and possibly cable TV service, without having to replace its metallic loop cables.

Q. Does GTE plan to deploy ADSL?

A. Yes. The Company states that it plans to roll out an ADSL product in 1997.

Q. What role do the Company witness see being played by competition?

A. Mr. Sovereign cites the 1996 Telecommunications Act as having a major impact. He notes that interexchange carriers ("IXCs") such as AT&T and new Competitive Local Exchange Carriers ("CLECs") are poised to invade the local exchange market. Cellular and Personal Communications Services ("PCS") providers can by-pass the entire local exchange telephone system. Mr. Sovereign opines that if these providers capture 20 percent of the market, the net revenue stream available for capital recovery would be reduced, and the remaining economic life of GTE's facilities would be shortened. Moreover, the pressure of competition on GTE's prices would reduce the Company's ability to recover its capital.

Similarly, Dr. Vanston's report cites cellular, cable TV and competitive access providers as sources of new competition.

Q. What relevance do these competitive developments have to life expectancy of GTE's

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"The year of ADSL", America's Network, February 1, 1997, page 18; "Motorola Plays ADSL Chip", America's Network, December 1, 1996, page 50; "Getting the Right Fit", America's Network, April 15, 1997, page 18.

Response to Public Counsel data request no. 126.

plant?

A. The relevance at this point is uncertain. It is possible, as the Company's witnesses assert, that competition could shorten the lives of GTE's plant, but a persuasive case might be made that it will have the opposite effect.

The most significant new development is indeed the Telecommunications Act of 1996. This Act requires the incumbent local exchange carriers ("ILECs") such as GTE to open their networks so that new entrants can lease unbundled network elements, such as loops, switches and transport facilities without having to construct parallel and redundant systems. The Act also requires that any retail ILEC service must be made available at wholesale to any entity wishing to resell it.

The effect of the Act is to permit competitors to continue to use the equipment and facilities of the ILECs, thus avoiding the by-pass of the ILEC plant that might have occurred had the Act not been passed. The network element most likely to be leased by the CLECs is the local loop, the distribution portion of which is provided entirely by metallic cables. Thus, a case can be made that the effect of the 1996 Act has been to reduce the competitive threat to metallic cable, not increase it.

The same can be said of the feared loss of market share. Mr. Sovereign is correct that loss of 20 percent of the market would reduce revenue flow, but it would also reduce the rate of growth, which is particularly relevant in a high-growth area such as GTE's Washington service territory. Slower growth might allow existing facilities to remain in place longer before their capacities exhaust and they must be replaced by higher capacity facilities.

Under present accounting conventions, the alleged strain imposed by competition on the ability of GTE to recover its capital is not a relevant consideration in setting service lives. The WUTC and the FCC both prescribe straight-line depreciation, which effectively allocates capital recovery pro-rata to the years of depreciable life of each asset.

But even if there were some way to adjust depreciation according to the distribution of the revenue generation of assets over their lives, it is by no means certain that competition requires that such depreciation be front-loaded. For example, competition may stimulate the deployment of the ADSL technology, which allows broadband services to be provided on existing copper wire pairs. If so, then the existing copper cables will be able to generate far more revenue in the future than is currently possible in the present voice-grade network. Under that hypothesis, metallic cable depreciation should be back-loaded, not front-loaded as Mr. Sovereign suggests.

Q. On page 17 of his testimony, Mr. Sovereign compares the depreciation lives proposed by GTE with those of a number of other telecommunications firms. Is this comparison relevant?

A. No, and for two reasons. First, the rates for the telecommunications companies in this comparison (other than GTE) are effectively unregulated because the companies are either not subject to regulation or they are "non-dominant" carriers under the FCC's rules. The lives shown in Mr. Sovereign's chart are the lives used for financial reporting, that is, for reporting expenses to stockholders and the Securities and

Exchange Commission. The lives used for financial accounting purposes are governed by the Generally Accepted Accounting Principle (GAAP") of "conservatism." As the FCC has found, GAAP is investor-focused, and may not always serve the interest of ratepayers. The FCC states:

> One of the primary purposes of GAAP is to ensure that a company does not present a misleading picture of its financial condition and operating results by, for example, overstating its asset values or overstating its earnings, which would mislead current and potential investors. GAAP is guided by the conservatism principle which holds, for example, that, when alternative expense amounts are acceptable, the alternative having the least favorable effect on net income should be used. Although conservatism is effective in protecting the interest of investors, it may not always serve the interest of ratepayers. Conservatism could be used under GAAP, for example, to justify additional (but, perhaps not "reasonable") depreciation expense by a LEC to avoid its sharing obligation. Thus, GAAP would not effectively limit the opportunity for LECs to manage earnings so as to avoid the sharing zone as the basic factor range option. In this instance, GAAP does not offer adequate protection for ratepayers.

The second reason these lives are inappropriate is that none of the comparison companies is an incumbent local exchange company ("ILEC"), as is GTE. The expected productive life of plant is largely dependent on its specific use. To use an extreme, but apt, analogy, the expected productive life of the copper wire installed in a house is many times that of a copper wire installed in an automobile. Despite the surface similarity, the use of plant by ILECs such as GTE to provide local exchange and exchange access service is much different from the use of plant by long distance carriers such as AT&T and MCI to provide interexchange services.

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[1]Prescription Simplification, Report and Order, FCC 93-452, released October 20, 1993, para. 49.

Long distance carriers are much less capital intensive than ILECs, and thus are able to replace their plant much faster than ILECs when the occasion demands. To service all homes and businesses in the nation, a long distance carrier needs only about 150 switches and 100,000 sheath kilometers of cable. To gain the same ubiquity for local exchange service, the ILECs require over 23,000 switches and 6,000,000 sheath kilometers of cable. No matter how motivated the ILECs may be, the sheer magnitude of their local network facilities means that replacement will be a long, drawn-out process.

It is obvious that wireless and cable TV firms are in altogether different businesses than local exchange carriers and therefore would reasonably expect to experience different service lives than an ILEC such as GTE.

Q. Can you cite the service lives of another industry that has plant similar to that of GTE?

A. Yes. The Edison Electric Institute has published the following average (mean) service lives for the primary outside plant accounts of electric utility companies:

Overhead Conductors & Devices	43.0 years
Underground Conductors & Devices	34.3 years
Services (Drops)	33.9 years

Q. Are there any other considerations mentioned by the witnesses that purportedly justify reductions in service lives?

Federal Communications Commission, 1994 Statistics of Common Carriers, p. 159.

"A Survey of Depreciation Statistics", AGA Depreciation Committee, EEI Depreciation Accounting Committee, 1992-1993

A. Yes. In his 1995 report, Dr. Vanston cited three drivers allegedly causing shorter service lives. In addition to technology and competition, "new services" were supposedly a cause of impending retirements of switching, circuit and copper plant. Notable among these were an array of broadband, multimedia communications services, including television, advanced fax, computer-based imaging, LAN interconnection, videoconferencing, interactive multimedia, video on demand, and interactive video.

Q. Are new services still a driver for shorter service lives?

A. Not to the extent they appeared in 1995, which may be the reason they are not mentioned in the direct testimonies of either company witness. In 1995 when the TFI report was prepared, all seven regional Bell companies and GTE had submitted Section 214 applications to the FCC to construct "video dialtone" systems that would carry cable television signals to the homes of their telephone subscribers through integrated broadband networks.

Specifically, in May 1994, GTE announced plans to build, over the coming 10 years, new video networks that would pass 7 million homes in 66 markets. These systems would provide broadcast, cable TV, and interactive TV programming in addition to telephone service. The Section 214 application called for the investment of $250 million by the end of 1995 to build fiber optic and coaxial facilities in four

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Vanston Attachment 2, page 6.

markets. These systems would have required the retirement of most of the copper cabling now serving the affected subscribers.

By the end of 1995, all of the video dialtone applications, including GTE's, had been withdrawn. To my knowledge, only the Southern New England Telephone Company continues to pursue the deployment of broadband integrated networks in its service territory.

To the extent that the TFI service lives reflected the expectation that plant would be retired owing to the advent of broadband services provided by fiber replacements to copper cable, the TFI study must considered dated.

Q. Is there any indication that GTE is failing to recover its investment?

A. No. Attachment 4 is a tabulation of the plant balances, additions, retirements and depreciation reserves during each of the past seven years for GTE Northwest. The final columns compute the rates of additions, retirements, depreciation and depreciation reserves relative to plant in service.

The Attachment shows that the rates of additions are consistently higher than the rates of retirements, indicating a growing plant base and a plant base that should be relatively new and therefore well short of the midpoint of its life cycle. The composite depreciation rate is consistently higher than the rate of retirements, which means either that the plant is being overdepreciated or that the depreciation rates anticipate that retirements will increase in the future.

Finally, the depreciation reserve ratio has grown steadily throughout the

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Telecommunications Reports, May 30, 1994, page 9

period. Indeed, this growth appears to be accelerating. The reserve ratio increased from 31.5 to 33.9 percent between 1990 and 1993. Between 1993 and 1996, it increased from 33.9 to 39.9 percent, over twice the rate of increase compared to the earlier period.

None of these data suggest that GTE is having difficulty recovering its capital. To the contrary, they suggest that depreciation rates, if anything, may be too high. They are well ahead of the rate of retirements, and they are causing a dramatic increase in depreciation reserve.

Q. Are there any competitive implications to these trends?

A. Yes. These trends mean that GTE's incumbent advantage is growing relative to its competitors. GTE's competitors must start from scratch. They must build new facilities with new capital. In contrast, GTE enters the competitive era with a plant base that not only is in place, but if present trends continue, will be largely paid for.

Q. Do these trends apply to the specific accounts at issue in this proceeding?

A. Yes. Attachment 5 provides data comparable to that in Attachment 4 but for the State of Washington investment in each of the plant categories at issue in this proceeding. I have consolidated the three cable accounts (aerial, underground and buried) separately for metallic and fiber cable.

The exhibit shows that the same patterns observed for GTE Northwest consolidated apply with respect to each of these account groups. In each case, the depreciation rates are running will ahead of the retirement rates and the reserve ratios are growing. Notwithstanding very substantial additions of new plant, the circuit and

metallic cable plant accounts are on the order of 44 percent depreciated. As would be expected, the somewhat newer digital switching and fiber cable accounts have lower reserve ratios, but those ratios are rising at a dramatic rate.

Again, these data indicate that GTE is indeed recovering its capital. If anything, they suggest that its present depreciation rates may be too high, not too low.

Q. What other value do these plant account data have?

A. They permit a check on the substitution analyses performed by TFI during 1994 and 1995. TFI posits that technologies replace each other along a fairly predictable curve. One need only estimate the rate at which the substitution is taking place to project the future migration from the retiring to the replacement technology. By replacing the TFI forecasts of substitutions with actual data for the initial years, it is possible to extrapolate the forecast life cycle according to the TFI methodology.

Q. Does this process of substituting actual plant data resolve any problems with the TFI study?

A. In Docket No. UT-940641, the Commission on remand rejected the TFI study when it was presented by US WEST. Its reasons for doing so were as follows:

> The Technology Futures, Inc, studies on which the Company relies for revising the service lives of seven categories of plant are not an adequate basis for revising those lives. The studies do not relate to U S WEST. They are generic to the entire industry. Moreover, the model used by Technology Futures, Inc., called the Fisher-Pry model, was developed to estimate the

plant life spans based upon forecasts of the rate of change in the adoption of substitute technologies. They are based largely on conjecture, subjective assumptions, and assertions as to rates of plant obsolescence, technological innovation, and new service requirements that are incapable of test or verification. The model uses only a single variable to explain rates of change; it is not a sophisticated econometric model. No probability statistics are provided with the forecasts. No regulatory entities use the forecasts to determine service lives for existing plant.

By using actual Company data, some of the Commission's objections to this study are ameliorated, if not fully resolved. The use of actual Company data at least relates the study to GTE and its Washington service territory. The remainder of the Commission's objections still stand, so the results must still be viewed with considerable circumspection.

Q. What is the effect of employing actual data in the TFI substitution analyses?

A. As I will demonstrate in the following discussion of the individual accounts, the TFI forecasts of substitution through 1996 are overstated by at least 30 percent and as much as 64 percent. The effect of applying the actual retirements in lieu of the TFI forecasts is to project service lives longer than those underlying the currently approved depreciation rates.

Q. Could you also have employed GTE's forecasts of plant retirements for the coming few years as a check on the TFI analyses?

A. I might have, but GTE has been unable or unwilling to provide forecasts of the

annual retirements from its Washington network, let alone broken down by account.

Q. What other data or studies do you have available on which to base projections of future plant service lives?

A. Unfortunately, the only other information available are the 1991 and 1994 depreciation studies that GTE submitted to the FCC. While these studies are somewhat dates, I can use them as a "sanity check" on the substitution analysis life indications from later plant data.

Digital Electronic Switching

Q. What is GTE's proposal with respect to the digital electronic switching account?

A. GTE is proposing that the present 16.5 year projection life be reduced to 10 years.

Q. How did GTE develop its proposed 10 year projection life?

A. This projection life is based on a composite remaining life estimate that is developed in Exhibit 12 on page 30 of the TFI report, which is Attachment 2 to Dr. Vanston's testimony. This table is a carry-forward by one year of the forecast which was included as Exhibits 5.17 and 1.10 in TFI's 1994 report. The table separates digital switching into six subelements and projects a remaining life for each. The composite remaining life as of January 1, 1995 was projected to be 6.3 years. In the previous year's study, TFI had predicted a 7.0 year remaining life.

TFI arrived at a recommended average service life by adding the remaining life to the expired life of plant as of the base period. Expired life will vary from company to company, so TFI recommend a range of between 9 and 11 years as the

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Response to Public Counsel data request nos. 106 and 120.

projection life for this account. GTE has picked the mid-point of this range, 10 years.

Q. Have you checked TFI's forecast retirements against actual retirements?

A. Yes. Attachment 6 allocates the year-end 1993 balance in the digital switching account among the six elements in the proportions shown by TFI. Exhibit 5.17 of TFI's 1994 study, a copy of which is included in Attachment 6, provides the percent surviving each year through 2015. By applying these percentages to the December 31, 1993 allocation to each subelement, I present the surviving balances of all pre-1994 vintages each year as predicted by TFI. From these data, I calculate the retirements assumed by TFI each year.

The far right-hand column of Attachment 6 shows the actual retirements from GTE's Washington state digital switching account. The comparison of the two estimates of retirements is as follows:

Digital Switching Retirements, 1994-1996
GTE Washington

TFI Projected ($000)	$53,072
Actual	31,494
Overstatement	40.7%

In making this comparison, I have assumed that all retirements during the 1994-1996 period were from pre-1994 vintages. If any were "infant mortalities" from post-1993 vintages, the TFI overstatement of retirements is even greater.

Q. Can you estimate a revised service life that assumes the same pattern of retirements as TFI but at the lower rate shown by actual data?

A. Yes. This can be done by proportions: 53,072 in TFI retirements is to 31,494 in actual retirements as x years is to 10 years

$$\frac{53,072}{31,494} = \frac{x}{10}$$

$$31,494x = 53,071*10 = 530,720$$
$$x = 530,720/31,494$$
$$x = 16.85 \text{ years}$$

Q. Has GTE identified any planned replacements of digital switches in 1997?

A. Yes. GTE has indicated it will retire the GTD-5 switch at Halls Lake Cluster. The total digital switching investment at this location is $20.4 million. Some of this investment, such as the power equipment, is not likely to be retired.

Q. What level of retirements has TFI forecast for digital switches in 1997?

A. TFI projected $30.3 million in digital switch retirements, which is half again the level of actual retirements indicated by GTE.

Q. Does the 1994 depreciation study shed any light on the appropriate life for the digital switching account?

A. No. There were inadequate retirements from this account prior to 1992 to provide any indication of expected service life.

Q. What projection life to you recommend for GTE Washington for the digital switching account?

A. I recommend retention of the present 16.5 year projection life.

Response to Public Couonsel data request no. 141 as modified May 28, 1997.

Response to Public Counsel data request no. 142.

Circuit Equipment

Q. What is circuit equipment?

A. Principally, circuit equipment is the electronics required to combine, or "multiplex" voice grade (4 khz analog; 56 kbps digital) signals into broadband signals, usually 1.544 mbps DS-1 "carrierized" signals, and then to demultiplex them back to voice grade or "baseband" at the other end of the transmission link.

Q. What change does GTE propose with respect to this account?

A. GTE proposes to reduce the service life of this account from 12 years to 8 years.

Q. On what basis does GTE propose to reduce the life of its circuit plant from 12 to 8 years?

A. TFI forecasts that by 2005, essentially all currently-deployed digital circuit equipment will have been replaced by SONET equipment. On this basis, TFI forecast a "conservative" average remaining life for plant in service on January 1, 1995 of 3.7 years. By combining this remaining life estimate with the expired life of existing plant, GTE estimates an average life of 8 years.

Q. Is there any indication that circuit plant is being retired at the rate predicted by TFI?

A. No. TFI's 3.7 year forecast in 1995 implies that about a quarter of all circuit equipment should have been retired by year-end 1996. Page 2 of Attachment 5 shows that only 3.2 percent of GTE's Washington circuit equipment was retired in 1995 and 6.0 percent in 1996. This cumulative 9.3 percent retirement is well short of the retirements predicted by TFI.

Vanston Attachment 2, pages 24, 25.

Q. What do you believe accounts for the disparity between TFI's forecasts and the record of GTE retirements so far?

A. The principal factor accounting for this disparity is probably TFI's erroneous prediction that SONET systems will be placed in the subscriber loops in response to the replacement of copper cable with fiber. At present GTE has no fiber cable in its distribution plant, nor does it plan to deploy fiber in its loop facilities.

Q. Have there been heavy retirements from this account in recent years?

A. Only in one year. Page 2 of Attachment 5 reveals that in the year 1992, the retirement rate for circuit equipment was 12.2 percent, higher than the addition rate or the depreciation rate. This single year is the only example of a retirement rate that exceeds either the addition or the depreciation rate for any of the categories presented in Attachment 5.

Q. What do you believe accounted for this high rate of retirements?

A. Probably it reflected the replacement of analog equipment with digital equipment. Digital carrierization provides much higher quality with less capacity than analog. Most analog circuit equipment has probably been retired. Unfortunately, GTE does not maintain separate accounts for these two technologies.

Additionally, the Company has been placing SONET systems in its interoffice facilities, which may have required some retirements.

Q. What indications are available with respect to the likely service life of GTE's existing

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May 28 response to Public Counsel data request no. 139.

Response to Pubic Counsel data request no. 119.

circuit plant?

A. GTE's 1994 depreciation study calculated the experienced life of plant retired in three-year bands. These life indications tend to be inversely related to the retirement ratios, that is, the lower the retirement ratio, the longer the life indication. The record of retirement ratios for the three-year bands is as follows:

Mortality Band	Retirement Ratio	1994 Study Indications
1988-1990	3.4%	17.8 Years
1989-1991	3.7%	15.7 Years
1990-1992	6.7%	12.3 Years
1991-1993	7.5%	11.8 Years
1992-1994	6.4%	n.a.
1993-1995	3.4%	n.a
1994-1996	4.0%	n.a.

The relationship between the retirement ratios and the life indications suggests that the 4.0% ratio for the latest three-year band equates to about 15 years.

Q. What projection life do you recommend for the circuit equipment account?

A. Certainly there is nothing in the record of this case to suggest a reduction in service life from the present 12 years. A persuasive argument could be made for an increase. However, it is my understanding that many telephone companies are changing out obsolescent subscriber line carrier systems that are in their feeder networks for the next generation digital loop carrier. For this reason, I recommend that the present service life of 12 years be retained.

Metallic Cable Accounts

Q. What changes does GTE propose for the metallic cable accounts?

A. GTE proposes to reduce the current projection lives of 21 years for aerial cable, 26

years for metallic cable and 23 years for underground cable to a common 15 years for all three metallic cable accounts.

Q. What is the basis of this proposal?

A. The basis of this proposal is the prediction by TFI that digital loop carrier systems requiring fiber feeder cables will serve 23 percent of all access lines by 2000, 50 percent by 2004 and 90 percent by 2010. TFI predicts the rapid deployment of fiber in the loop after the turn of the century under several scenarios, but the middle scenario predicts that half of the distribution plant will have been converted to fiber by about 2003. The basic driver for this conversion will be the need to provide new, broadband services.

By compositing its forecast for interoffice, feeder and distribution cable conversions, TFI arrives at an average remaining life estimate of between 7.0 and 8.7 years for plant in service at the beginning of 1995. For a typical company, this would correspond to a projection life of between 14 and 16 years for the installed base of equipment.

Q. What has been the recent experience with the metallic cable accounts?

A. Attachment 7 is a series of charts relating to these accounts. The first chart shows the ratio of retirements to plant in service. The chart reveals that these retirement ratios have declined significantly over the past ten years. In 1995 and 1996, they

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Vanston Attachment 2, page 18.

Id., pages 19-22.

Id., pages 22,23.

were at their lowest levels in a decade for all three accounts.

The remaining charts show the dramatic growth in these accounts and the minimal retirements. Indeed, compared to additions, retirements are barely noticeable.

Q. Have you compared TFI's 1994 forecast of the retirements of metallic cable with GTE's actual experience?

A. Yes. TFI's 1994 study, upon which the 1995 update is based, contained a set of retirement projections for the interoffice, feeder and distribution metallic cable investment that was in service at the end of 1993. Using TFI's percentage distribution of GTE's actual plant in service on that date, I have identified the plant balances and retirements assumed by TFI for the composite of the three metallic accounts. The underlying TFI documentation and my calculation of assumed retirements is contained in Attachment 8. That attachment also shows GTE's actual retirements during the years 1994, 1995 and 1996. The following is a comparison of TFI's predicted retirements with GTE's actual retirements:

Year	TFI Predicted Retirements	GTE Actual Retirements	Percent Overstatement
1994	$13,877,462	$7,665,779	44.8%
1995	18,965,903	4,529,499	76.1%

1996	16,054,948	5,125,632	68.1%
1994-1996	48,898,313	17,320,910	64.6%

In this table, I have again assumed that all the retirements during 1994-1996 were from the pre-1994 vintages. If any retirements were from the vintages placed after 1993, then TFI's overstatement is even larger than shown.

Q. What do you believe accounts for TFI's overstatement of GTE's retirements?

A. TFI assumed conversions from metallic to fiber cable plant that haven't occurred, nor does it appear they will occur. Specifically, TFI assumed that the telephone companies would begin to employ fiber in the loop, thereby requiring the replacement of most copper distribution cable over the coming decade. This is simply not happening, at least with respect to GTE. The Company does not employ fiber in its distribution plant, nor does it have any plans to do so. No doubt this condition reflects the parent company's cancellation of its plans for integrated broadband networks, a development unknown to TFI at the time of its 1994 and 1995 reports. To the extent the Company intends to provide broadband services, it appears it will use the ADSL technology, which can be provided by the existing copper-

based plant.

In the meantime, GTE's deployment of copper relative to fiber is based on a defined set of criteria. Copper is placed under the following conditions:

> Where the ultimate customer loop does not exceed 15 kilofeet and structural facilities such as conduit and poles are available.
>
> Where unused copper facilities exist, and the placement will provide continuity from the feeder/distribution remote terminal to the central office.
>
> For the provision of network connection between the feeder/distribution point to the subscriber pedestal terminal.
>
> From a remote switch or DLC system when the facilities are designed to support digital rates no higher than 144 kbps. (Later in 1997, GTE will offer ADSL which currently can provide up to 8 mbps over copper facilities. A 44 mbps ADSL configuration is under development).

GTE engineers are instructed to design the capacity of the loop facilities to satisfy forecast requirements 15 to 20 years into the future.

Q. If TFI has correctly predicted the pattern of fiber for metallic displacement, what service life is indicated by GTE's actual retirements data?

A. Again using a proportional relationship, I compute the predicted service life as 42.3 years:

$48,898 in TFI retirements is to $17,321 in actual retirements as x years is to 15 years.

$$\frac{48{,}898}{17{,}321} = \frac{x}{15}$$

$$17{,}321x = 48{,}898 * 15 = 733{,}470$$
$$x = 733{,}470/17{,}321$$
$$x = 42.3 \text{ years}$$

Q. Are there any other data you can look to in predicting the service life of these metallic cable accounts?

A. The somewhat dated 1994 depreciation study yields the following life indications based on the then most recent three-year retirement bands:

Aerial Cable:	1989-1991	25.1 years
	1990-1992	24.6 years
	1991-1993	23.9 years
Underground Cable:	1989-1991	40.6 years
	1990-1992	34.7 years
	1991-1993	32.2 years
Buried Cable:	1989-1991	21.9 years
	1990-1992	22.9 years
	1991-1993	23.4 years

If GTE could have provided a forecast of its cable plant retirements or of the percentage of circuits or cable miles in copper vs. feeder, it might have been helpful in estimating the service lives of these accounts. Unfortunately, the Company was either unable or unwilling to provide these estimates.

Q. What service lives to you recommend for the metallic cable accounts?

A. I am sensitive to the Company's concern that service lives not be overestimated. For this reason, I am inclined to disregard the very long life suggested by the application of actual retirements data to the TFI project of technology substitution. The limited actuarial information does not support a reduction in service life, however. Quite the contrary, it suggests a lengthening of life for the aerial and underground cable

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Response to Public Counsel data request no. 137.

Responses to Public Counsel data request nos 106, 121 and 120.

accounts.

This information, along with the very low level of retirements during the most recent years and the absence of any indication that the Company intends to convert its loops to fiber, suggests that the present life projection of 23 years for buried cable should be retained. I recommend this same service life of 23 years for aerial cable. The reasonableness of these estimates is supported by the fact that it corresponds with the midpoint of the 20 to 26 year service life range found appropriate for these two accounts by the FCC.

Underground cable appears to have a life expectancy longer than the 26 years now prescribed. I propose a life that corresponds to the high end of the range of service lives now prescribed as reasonable by the FCC. That life is 30 years.

Non-metallic Cable Accounts

Q. What is the Company's proposal with respect to the non-metallic cable accounts?

A. The Company proposes that the present service life of 30 be shortened to 20 years.

Q. What is the basis for this proposal?

A. The only information supporting the these life estimates is the statement by TFI that fiber cable is subject to technological obsolescence, topological obsolescence, mechanical degradation, and optical degradation. "Topological obsolescence" is defined as occurring when the location, sizing, routing or architecture of a fiber installation later proves wrong. Putting these factors together, TFI predicts that the

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FCC Docket No. 92-296 Orders released June 28, 1994 and May 4, 1995.

Id.

projection life for fiber cable is 20 years.

Q. Are there any data that would support this reduction in projection life?

A. None that I have found. The last page of attachment 5 shows that retirements from this account during the past three years have been negligible, yet the depreciation rate has been about 4.6 percent, with the result that the reserve has increased to almost 25 percent. In other words, the Company has already recovered one quarter of the investment in an account that has experienced minimal retirements.

Q. What is your assessment of the arguments presented by TFI?

A. None of the four effects cited by TFI appear in evidence. "Topological obsolescence" would never be a cause for retirement, only underutilization. Fiber cables are typically capable of carrying 50,000 simultaneous voice grade circuits. With this sort of capacity, fiber is much less likely to experience capacity exhaust than metallic cable. It is reasonable to suppose that fiber has a longer life than metallic cable.

Q. What service lives do you recommend for non-metallic cable?

A. Lacking any basis for changing the service life, I recommend retention of the present 30 year life for all three non-metallic cable accounts. This projection life corresponds with the high end of the range of lives found reasonable by the FCC.

Summary

Q. Would you please summarize your recommendations?

Vanston Attachment 2, page 24.

Id.

A. I recommend retention of the existing projection lives for six of the eight accounts at issue in this proceeding. I recommend an increase in the projection lives for the aerial and underground metallic accounts. The current lives and my recommendations are summarized as follows:

Account		Projection Lives (Years) Current	Recommended	
2212.0	Digital Switching Equipment	16.5	16.5	
2232.0	Circuit Equipment		12.0	12.0
2421.1	Aerial Cable Metallic	21.0	23.0	
2421.2	Aerial Cable Non-metallic		30.0	30.0
2422.1	Underground Cable Metallic	26.0	30.0	
2422.2	Underground Cable Non-metallic		30.0	30.0
2423.1	Buried Cable Metallic	23.0	23.0	
2423.2	Buried Cable Non-metallic		30.0	30.0

Q. Does this complete your testimony?

A. Yes. It does.