Ex. __ (MGD-T)

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Pricing Proceeding for Interconnection, Unbundled Elements, Transport and Termination, and Resale	)	DOCKET NO. UT-960369
In the Matter of the Pricing Proceeding for Interconnection, Unbundled Elements, Transport and Termination, and Resale for U S WEST COMMUNICATIONS, INC.	)	DOCKET NO. UT-960370
In the Matter of the Pricing Proceeding for Interconnection, Unbundled Elemetns, Transport and Termination, and Resale for GTE NORTHWEST INCORPORATED	)	DOCKET NO. UT-960371

DIRECT TESTIMONY

OF

MICHAEL GREGORY DUNCAN

March 27, 1997

WUTC DOCKET NO. UT-960369
EXHIBIT NO. (T) 56
ADMIT [X] W/D [ ] REJECT [ ]

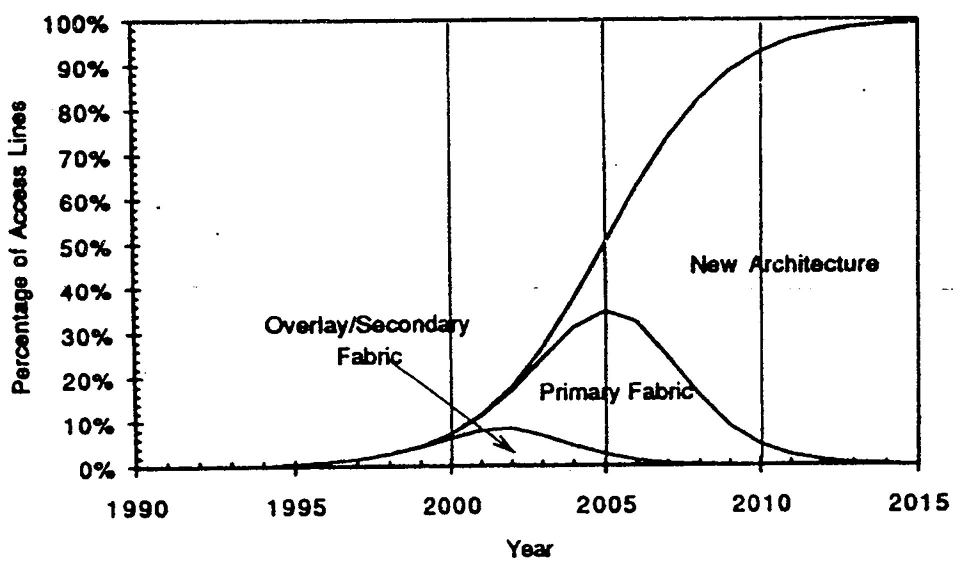
To get a sense of the timing of how ATM switching will be deployed, we asked network planners from LECs what they thought the dominant switching scenario would be in future years. The following table indicates the majority of responses:

Year	Dominant Scenario
1995	ATM as an overlay network
2000	ATM as a secondary fabric on existing switches
2005	ATM as a primary fabric on existing switches
2006	ATM as a new architecture replacing existing switches

Exhibit 20 graphically shows a forecast of how the percentage of access lines on each of the ATM implementations may change over time. As indicated by the network planning consensus, implementation as an overlay or as a secondary fabric dominates through 2000. However, since ATM's overall percentage of access lines is under 10% through 2000, the number of access lines served by these implementations is small. The period of 2000 to 2005 will see the primary fabric implementation grow to play the dominant role, peaking in 2005 at 32% of access lines. Beginning in the early 2000s, new architecture ATM switches will begin to be installed in the network. After 2005, they begin to replace the aging 5ESS, DMS-100, and GTD-5 architectures and achieve dominance by 2010, as indicated by the network planners.

Exhibit 20

ATM Access Lines by Implementation Alternative



Source: Technology Futures, Inc.

Summary of Technology Forecasts

The forecasts imply rapid obsolescence of the existing local telecommunications infrastructure and accelerated adoption of new technology. These changes are occurring across all major categories of network equipment. Each of these changes is integral to the transformation from a voice-oriented public telephone network to a public ATM-switched multimedia network-a transformation we believe will be complete by about 2015. For GTE, this implies an Average Remaining Life of 3.7 years for digital circuit equipment, 2.8 years for analog circuit equipment and 6.9 years for Digital Switching. For OSP copper cables the ARLs are: interoffice 2.9 years, feeder 7.4 years, and distribution 9.7 years.

Ex. __ (GMD-T)

GTE NORTHWEST INCORPORATED

DIRECT TESTIMONY OF

GREGORY MICHAEL DUNCAN

WUTC UT-960369, 960370, 960371

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Gregory Michael Duncan. My business address is 777 South Figueroa St., Suite 4200, Los Angeles CA 90017.

Q. BY WHOM ARE YOUR EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by National Economic Research Associates as Vice President.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. I previously worked for GTE Laboratories, Inc. with the Department of Economics and Statistics, where I was a Staff Scientist, a position reserved for a small number of independent researchers, with responsibility for developing, proposing and conducting research as well as supervising the research of other economists and statisticians at GTE Labs. I received a M.A. in Statistics in 1974 and a Ph.D. in Economics in 1976, both from the University of California, Berkeley. Beginning in 1975, I taught in the Economics Department and Statistics Program at Northwestern University in Evanston, IL, where I was an Assistant Professor of Economics and of Statistics. There my teaching included Demand and Production Theory, Econometrics and Statistics. I also conducted research on demand and cost and production that appeared in refereed journals. I left Northwestern in 1979 to join the faculty of Washington State University. There I served as a Professor of Economics and of Statistics. My research continued in demand, cost and production theory and applications as well as in other topics. During that period, I was one of the first Associate Editors of the academic journal *Econometric Theory*. I have published many referred papers on cost, production, and demand analysis, including the results of the research that supported other testimony before a number of regulatory commissions. During my career I have spent a good part of my time working on the analysis of cost data and have been fortunate enough to be able to contribute much to the academic literature on costs and production. My papers in this area appear in the *International Economic Review, Proceedings of the National Academy of Sciences*, *Econometrica*, and the *Journal of Risk and Uncertainty*. In addition, under my supervision, a number of Ph.D. students at Northwestern University, Washington State University and Boston University wrote dissertations that utilized modern cost and production methods. The results of some of these dissertations have also been published as contributions to the economics profession's understanding of costs. My particular expertise includes the formulation, specification, estimation and testing of cost models. Consequently, I was asked to teach and have taught numerous graduate level courses that covered directly and indirectly all aspects of cost analysis.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY TODAY?

A. I will address the economic flaws in the Hatfield model Version 3.1 which is contained in the attached paper entitled "Economic Evaluation of the Hatfield Model, Release 3.1."

Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY.

A. Yes. The Hatfield Model is result driven and generates unrealistically low costs and rates. The Model's estimated rate for basic residential service is typically about one half of an Incumbent Local Exchange Carrier's (ILEC's) actual costs, and also lower by about the same amount relative to residential service rates estimated by other cost models. At the Hatfield Model's estimated rates, no rational Competitive Local Exchange Carrier (CLEC) would even consider entering the market as a reseller of network services, even at very generous wholesale discount rates of 10 to 25 percent. Instead, market entrants would find it far more profitable to purchase all of the ILEC's unbundled elements and then repackage them for sale. As a result, facilities based market entry would be significantly discouraged.

The Model is fundamentally flawed, and should *not* be used as the basis for setting prices for interconnection or unbundled network elements, or for quantifying the subsidy of local exchange service relative to universal service programs. The problems with the Model go well beyond using the right user-adjustable inputs. While correct input prices and values for other inputs (e.g., fill factors) are very important—both common sense and economic theory dictate that incorrect input prices will produce incorrect costs for network elements—the problems with the Hatfield Model run deeper. Even if all inputs were valid, the Model would generally produce incorrect estimates of the incremental costs that incumbents actually expect to incur in making network elements available to new entrants.

It is unclear how the Hatfield Model proponents would like to classify their model—whether to call it an engineering model or a costing model or even a hybrid model. The Model Description explains that the Hatfield Model "builds an engineering model of a local exchange network with sufficient capacity to meet total demand, and to maintain a high level of service quality." It is apparent that the model does in fact build loop structure according to a set of engineering rules. However, when questioned about some of the unrealistic engineering assumptions of the Model, its proponents characterize the model as something other than an engineering model. How one classifies a model does not relieve the modelers from the responsibility to base the model on a *correct* set of methodologies and assumptions.

There are three general methods of calculating cost: an accounting method, a statistical method, or an engineering method. Combinations of these yield the hybrid methods mentioned above. Details aside, the majority of the costing exercise carried out by the Hatfield Model is based on its engineering assumptions. For example, the Hatfield Model's engineering assumptions dictate the amount of distribution and feeder cables, the number of "SAIs" to connect these distribution and feeder cables , the number and size of switches housed in each wire center, the number of DS-0's (a 64kbp voice-equivalent circuit) required for transport facilities, etc., in order to calculate cost for ILECs. Therefore, it is crucial that, in order to produce correct cost estimates, the

Hatfield Model get its engineering assumptions right.

It is also crucial that the Model gets its economic theory right. Only with sound economics and engineering can the Model have any chance of assisting in accomplishing the goals of the Telecommunications Act of 1996. We have confirmed that much of the Model's engineering assumptions are unrealistic and wrong and that its economic framework is hopelessly flawed.

Particular shortcomings of the Hatfield Model fall into two major areas. First, the Model ignores market realities that a typical ILEC faces; it is completely independent of past ILEC investment decisions and simulates a network far different from the actual ILEC's network. Moreover, estimates of the Model have never been compared to actual observable data to see how well its predictions comport with reality.

Second, in addition to the lack of realism, the Hatfield Model fails to utilize sound economic methods to accomplish its purpose of predicting the cost of unbundled network elements. Particular shortcomings of the Model include the following:

The Hatfield Model assumes that the ILEC's present facilities and assets—end offices, interoffice trunks, tandem switches, switching ports, feeder and distribution facilities—will be scrapped. In its place the Model conceptualizes an entirely new network, one that claims to use the most efficient technology at the lowest possible cost utilizing the most streamlined loop structures.

The Model endows firms with perfect hindsight, which provides cost savings not available to any real company operating in a forward-looking environment. Indeed, it models a firm where there is no uncertainty, no technological change, and no growth, thus ignoring the very concerns that are paramount in the telecommunications environment today.

The Model's predictions do not agree with those of other industry models that are based on *firm specific* data. Moreover, the Model incorrectly identifies GTE, U S WEST, and other ILEC serving areas. It grossly underestimates, in some cases by factors of 2, actual plant needed to serve areas. It also builds one firm's plant in other firms' serving areas and vice versa (e.g., the Model erroneously identifies other ILECs' wire centers as GTE's, and similarly identifies GTE's wire centers as belonging to other ILECs).

The Model's input price assumptions (e.g., wire center equipment prices and switch prices) are consistently lower than what ILECs actually pay. For example, comparison of actual GTE California switch contracts show that the Model's switch cost per line predictions are roughly 60% of actual GTE contract prices. Some of these assumptions are user-adjustable, but others are either hard-wired data or intrinsic modeling components of the cost function and thus cannot to be adjusted.

The Model claims to consider only "forward-looking technology" which reflects "forward-looking cost." This concept, however, is used only to justify lower costs. On the expense side, its methodology is for the most part backward looking—predicated on past demand and past costs as published in ARMIS. On the investment side, it builds plant incapable of meeting the present demand and even more incapable of meeting future demand. The understatement of investments and costs is done in the name of eradicating "stranded" infrastructure—yet, except for a very small percentage, the Model eradicates infrastructure that is necessary and in use today to provide telephone service and which will be necessary for the foreseeable future.

The Model is entirely static. Growth is not properly factored in, and the Hatfield modelers generally assume that the cost of building and maintaining spare capacity for future expansion should not be considered. However, the rapid increase in the need to create new area codes, increased Internet usage, and the popularity of second and third residential phone lines all point to a necessity for expansions in the local loop plant everywhere, in the present time and in the future. These facilities must be built by existing ILECs. The Model simply ignores these actual costs, market realities, and demand considerations and therefore fails to estimate a real "forward-looking cost".

The Model's method of equating the lowest observed expense-to-investment ratios in the industry to individual firms' forward-looking expense factor is unjustified. Because it ignores economic tradeoffs and scale differences between firms (i.e., it assumes an identical isoquant curve for all firms across the industry), such a "pick and choose" approach runs the risk of providing networks that cannot handle any firm's current traffic and service demands.

The Model is similarly selective in its recognition of the effects of competition. While suggesting that reductions in various expense and overhead factors is justified on the grounds that increased competition will wring out alleged inefficiencies on the part of ILECs, it denies that the same competition will decrease the economic lives of equipment, that is, increase the rate of depreciation; it also denies that the same increased competition will increase costs of capital due to the increased risk to revenue streams that heretofore have been nearly risk free.

The Model's method of calibrating expenses by the use of constant volume and price insensitive cost factors is econometrically and statistically unsound. Moreover, determination of the common cost factor is based on a single year of AT&T's costs, not ILEC costs. The Model then allocates its estimate of common costs uniformly over network elements. This approach is theoretically unsound and contradicts a principle of costing, agreed to in California by AT&T (which treats the recovery of common costs as a pricing problem).

In the Model, ILECs are subject to the cost reducing effects of using the latest technology, but the Model inadequately reflects the effects of such cost reductions in its estimated economic cost of investments.

The Model employs artificial jurisdictional cost allocations to determine its cost factors. One problem caused by this methodology is that costs incurred by a home office in one state of a firm operating in many states show up as revenue, rather than as cost flows, with the consequence that the expenses calculated by the Model can be negative. This biases the costs in the home office state downward.

The Model's assumptions that (1) all volumes currently served by local exchange carriers will be served by a brand new entrant, and (2) that a brand new infrastructure instantly materializes, are inconsistent with both reality and sound economics. Accordingly, costs based on such a model will *not* be representative of the costs ILECs incur in providing services and unbundled network components.

Finally, the Model simply fails to provide external or internal justification of its validity, thereby precluding even the slimmest basis for regulators to trust its outputs. Externally, its predictions of presently necessary investments and costs do not comport with real data. Internally, it fails all consistency checks on necessary features of mathematical structure capable of representing the minimum cost of producing telecommunications services using the most efficient forward-looking technology.

The Hatfield Model developers defend their costs by arguing that any difference between the costs of their model and costs reported by the ILECs (either accounting costs that are required by law and by regulators or the cost produced by LEC incremental cost models) represent the costs of over-investment. For example, the Model claims that about half of the LEC's current plant represents over-investment.

Apart from the fact that this over-investment label is entirely meaningless, since the Model calls over-investment anything with which they do not agree, and that the Model's estimate of the so-called gap is fatally flawed by the theoretical and measurement problems, it defies common sense to believe that over-investment of this degree could take place. Regulators (both at the federal and state level) would have to have been quite derelict in their public responsibilities for such this event to have occurred, an unlikely event given the scrutiny the telecommunications industry receives.

The debate over the merits of this Model is more than academic. Basing prices on costs that no real-world provider could hope to achieve without service degradation or outright network failure will stifle, and not promote, facilities-based competition Therefore, we recommend that the Model not be adopted.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.