BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Investigation into Pricing of Unbundled Network Elements	)))	Docket No. 990649B-TP

SURREBUTTAL TESTIMONY OF

DAVID G. TUCEK

ON BEHALF OF

VERIZON FLORIDA INC.

SUBJECT: LONG RUN INCREMENTAL COSTS

March 18, 2002

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INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is David G. Tucek. My business address is 1000 Verizon Drive, Wentzville, MO 63385.

Q. ARE YOU THE SAME DAVID G. TUCEK WHO PREVIOUSLY FILED DIRECT TESTIMONY IN THIS DOCKET?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

A. My surrebuttal testimony responds to the rebuttal testimonies of Dr. August A. Ankum and Mr. Warren R. Fischer filed on behalf of the carriers collectively known as the ALEC Coalition. With respect to both of these witnesses' testimonies, my surrebuttal testimony addresses those issues dealing with Verizon Florida Inc.'s (Verizon) long-run, forward-looking economic cost model, ICM-FL. Other Verizon witnesses will address Dr. Ankum's and Mr. Fischer's recommendations concerning rate deaveraging, depreciation and the cost of capital.

Q. WHAT EXHIBITS ARE YOU SPONSORING?

A. I am sponsoring the following six exhibits:

(1) Surrebuttal Exhibit DGT-1, "Comparison of ICM-FL Modeled Investment with Reproduction Cost ";

(2) Surrebuttal Exhibit DGT-2, "Impact of Market Segmentation on DS-1 Requirements";

(3) Surrebuttal Exhibit DGT-3, "Difference Between a 4:1 and a 6:1 Concentration Ratio";

(4) Surrebuttal Exhibit DGT-4, "Impact of High Target Fill Factors";

(5) Surrebuttal Exhibit DGT-5, "Comparison of Modeled Investment per Line"; and,

(6) Surrebuttal Exhibit DGT-6, "Impact of C. A. Turner and Calibration on Fixed Allocator".

Note that Surrebuttal Exhibit DGT-5 is confidential.

Q. HOW IS THE REMAINDER OF YOUR SURREBUTTAL TESTIMONY ORGANIZED?

A. The remainder of my surrebuttal testimony is organized into five sections. First, I address the fundamental flaw underlying many of Dr. Ankum's recommendations relating to Verizon's cost study. Second, I point out several inconsistencies, unsupported statements and misstatements of fact contained in Dr. Ankum's rebuttal testimony. Third, I address Dr. Ankum's specific allegations and recommendations concerning Verizon's cost study. Fourth, I explain why the Commission should disregard Mr. Fischer's recommendations concerning ICM-FL's use of the C. A. Turner index and ICM-FL's calibration adjustment, as well as his comparison of

Verizon's fixed allocator with that of BellSouth. Finally, I present a summary of my surrebuttal testimony and highlight the reasons why the Commission should disregard Dr. Ankum's and Mr. Fischer's recommendations.

DR. ANKUM'S REBUTTAL TESTIMONY SUFFERS FROM A FUNDAMENTAL FLAW

Q. WHAT FUNDAMENTAL FLAW UNDERLIES DR. ANKUM'S REBUTTAL TESTIMONY?

A. Dr. Ankum argues that TELRIC estimates must be based on a totally hypothetical network. For example, Dr. Ankum makes the following assertions and recommendations in his rebuttal testimony:

(1) Remote terminals (RTs) should be placed as close to the customer as possible (Ankum Rebuttal, p.6);

(2) The use of copper should be decreased and the use of fiber should be increased (Ankum Rebuttal, p 7);

(3) The GTD-5 switch should be eliminated from Verizon Florida's modeled network (Ankum Rebuttal, p. 9);

(4) Verizon's NRC study should presume that the former GTE service ordering centers are consolidated with Verizon's, whether they

actually are or not (Ankum Rebuttal, p. 15);

(5) TELRIC-based switching rates should be based only on cutover switch prices, and should not reflect the pricing for additions to existing switches (Ankum Rebuttal, pp. 83-84).

While each of the above recommendations is flawed in its own right, taken together, they make clear that Dr. Ankum advocates basing TELRIC estimates and UNE rates on a network that is disconnected from the real world, and that is completely unlike the network from which the UNEs will be provisioned. Dr. Ankum's disregard for the characteristics of the real network indicates that he is unconcerned with the costs that Verizon will incur in provisioning UNEs.

Q. ARE THERE OTHER PORTIONS OF DR. ANKUM'S REBUTTAL TESTIMONY THAT INDICATE HE IS NOT CONCERNED WITH THE CHARACTERISTICS OF THE REAL NETWORK, OR WITH THE COSTS VERIZON WILL INCUR IN PROVISIONING UNES?

A. Yes. Dr. Ankum makes several recommendations concerning fill factors for various components of the network. These recommendations share two characteristics. First, they are unsupported by any reference to Verizon's Florida network. Second, with the exception of Dr. Ankum's completely unsupported recommendation for conduit, the recommended values are all in excess of 75 percent. In making these fill factor recommendations, Dr. Ankum is advocating a network operating nearly at capacity and ignores, as I explain below, the impact of discrete facility sizes on fill factors.

Additionally, at page 82 of his rebuttal testimony, Dr. Ankum relies on a partial excerpt of Paragraph 685 from the FCC's Local Competition Order to support his position that the switch prices underlying Verizon's TELRIC estimates should reflect the assumption that Verizon is completely rebuilding its switch network. In presenting only an excerpt as if it were the entire paragraph, Dr. Ankum has misdirected the Commission's attention away from the FCC's stated intent for the TELRIC standard. This is easily seen by reading the entire paragraph:

> Under the third approach, prices for interconnection and access to unbundled elements would be developed from a forward-looking economic cost methodology based on the most efficient technology deployed in the incumbent LEC's current wire center locations. This approach mitigates incumbent LECs' concerns that a forward-looking pricing methodology ignores existing network design, while basing prices on efficient, new technology that is compatible with the existing infrastructure. *This benchmark of forward-looking cost and existing network design most closely represents the incremental costs that incumbents actually expect to incur in making network elements available to new entrants.* Moreover, this approach encourages

> facilities-based competition to the extent that new entrants, by designing more efficient network configurations, are able to provide the service at a lower cost than the incumbent LEC. We, therefore, conclude that the forward-looking pricing methodology for interconnection and unbundled network elements should be based on costs that assume that wire centers will be placed at the incumbent LEC's current wire center locations, but that the reconstructed local network will employ the most efficient technology for reasonably foreseeable capacity requirements. (Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, 11 FCC Rcd. 15499 (1996) ("First Report and Order") [*emphasis added*]).

It is clear from reading the entire paragraph that the FCC intended TELRIC to estimate the costs ILECs expect to incur in providing UNEs out of their own networks, not out of some fantasy or hypothetical network. To argue that the inputs for switch prices -- or any other input -- must be developed as if the network is built all at once just because the FCC only specified that wire center locations must be fixed, is both self-serving and plainly contrary to the FCC's intent. This is true even if the model employed designs the network all at once -- to be useful, costs must be grounded in reality and model inputs must reflect actual experience.

Q. HAS THE COMMISSION DETERMINED THAT COSTS AND MODEL INPUTS MUST BE GROUNDED IN REALITY?

A. Yes. In Docket Number 980696-TP, AT&T argued that the modeled sharing percentage for buried plant should exceed actual experience because sharing opportunities will be greater in a UNE environment, and because opportunities exist for sharing with other industries in a scorched node environment. The Commission disagreed:

> While this proceeding is to determine the cost of a forward-looking scorched node network, there needs to remain a basis in reality if the costs developed for the network are to have any relevance to the cost of basic local telephone service. We believe that assuming sharing percentages which require, for example, power and cable TV companies to rebuild their networks so that more of the cost of a telephone network can be shifted to other industries, means a network severed from reality.
>
> (Order, Docket No. 980696-TP (January 7, 1999), p. 129).

Q. DOES ICM-FL MODEL VERIZON'S EXISTING FLORIDA NETWORK?

A. No, but it comes closer to this than any other model of Verizon's Florida network that has been provided to this Commission. As I explained in my direct testimony (pp. 3-4), unlike earlier versions of ICM, ICM-FL does not model digital loop carrier (DLC) locations by imposing a copper-loop length restriction, and the end-office assignments in ICM-FL's modeled

SONET rings do not assume every hub office is an access tandem. These changes cause the network modeled by ICM-FL to more closely resemble the network from which Verizon provisions UNEs in Florida.

Q. DOES ICM-FL PRODUCE UNREASONABLY HIGH UNE COSTS AND RATES AS DR. ANKUM CONTENDS AT PAGES 5-6 OF HIS REBUTTAL TESTIMONY?

A. No. Dr. Ankum bases this contention, in part, on his claim that there are unspecified errors in ICM-FL, and on his comparison of Verizon's proposed UNE rates with those in other jurisdictions. This latter argument improperly ignores the differences among states and mistakenly assumes that UNE costs must be based on a hypothetical network that will never exist anywhere. Rather than look to the costs in other states, it is more useful to compare ICM-FL's modeled network and costs to Verizon's existing Florida network. For example, a comparison of modeled and actual sheath feet, in thousands, shows:

	Modeled	Actual	Variance
Fiber	13,552	22,247	-39.1%
Copper	132,507	164,160	-19.3%
Total	146,059	186,407	-21.6%

In terms of the physical amount of sheath feet, ICM-FL models a much smaller, and therefore less costly, outside plant (OSP) network. Likewise, as shown in Surrebuttal Exhibit DGT-1, the level of investment modeled by ICM-FL compares favorably with the reproduction cost of the modeled network. It is clear that ICM-FL does not model unreasonably high costs when compared to Verizon's existing Florida network.

Q. WHY IS THE REPRODUCTION COST OF THE EXISTING NETWORK A USEFUL BENCHMARK AGAINST WHICH TO GAUGE ICM-FL'S RESULTS?

A. The key issue in this proceeding is cost -- particularly the cost of the network as whole. While Dr. Ankum has criticized ICM-FL based on certain specific characteristics, the first question that must be addressed is how the cost of the modeled network compares to the existing network overall. The only comprehensive way to answer this question is to measure the network in terms of dollars. However, because the relative prices of telephone plant change over time, book investment is not suited for this purpose. The C. A. Turner indices measure this change in relative prices by account and vintage year, and develop a dollar measure of the reproduction cost of the existing network. If modeled investment is substantially above the reproduction cost without some valid reason, then the efficacy of the modeling process is called into question. As shown in Surrebuttal Exhibit DGT-1, modeled investment is *below* the reproduction cost. Accordingly, Dr. Ankum's broad charge that ICM-FL produces unreasonably high rates and costs is demonstrably false.

Q. WHY ARE ICM-FL'S MODELED INVESTMENT AND SHEATH FEET LESS THAN THE EXISTING NETWORK'S REPRODUCTION COST AND SHEATH FEET?

A. The main reason is that the modeled network assumes a level of optimization that will never be achieved in the real world. For example, when ICM-FL models the fiber routes connecting DLCs to the central office, it assumes that all fibers -- including those used for interoffice fiber routes -- share the same sheath to the fullest extent possible. Likewise, when DLCs are sized, ICM-FL places the smallest DLC capable of serving the required number of lines. In the real world, the network grows incrementally, so that multiple fiber sheaths may be placed along the same route, or more than one DLC may be placed to serve a group of customers even though only one is required given current demand.

These outcomes result from the assumption that the network is built all at once, thereby causing the modeled placement and material costs to be understated. Cost models making this assumption, including ICM-FL, also assume economies of scope and scale that will never be realized. Consequently, the resulting cost estimates must be viewed as a lower bound on the forward-looking incremental costs of provisioning UNEs to new entrants. (See Tucek Direct, pp. 20-22). This basic model characteristic must be kept in mind when considering arguments that decrease estimated costs in the name of achieving greater efficiency or a more optimal design.

DR. ANKUM'S REBUTTAL TESTIMONY IS INTERNALLY INCONSISTENT, MISSTATES FACTS, AND CONTAINS UNSUPPORTED STATEMENTS AND RECOMMENDATIONS

Q. WHAT DOES THIS PORTION OF YOUR SURREBUTTAL TESTIMONY ADDRESS?

A. This portion of my surrebuttal testimony addresses inconsistencies among the recommendations and positions advocated by Dr. Ankum. I also point out certain unsupported statements and recommendations, as well as misstatements of fact, made by Dr. Ankum. My intent here is to ensure the Commission's record is as clear and accurate as possible. I do not speculate on the reasons why Dr. Ankum's rebuttal testimony contains these misstatements.

Q. HOW IS DR. ANKUM'S REBUTTAL TESTIMONY INCONSISTENT?

A. There are five major inconsistencies in Dr. Ankum's recommendations. The first inconsistency has to do with his recommended 6:1 concentration ratio for DLCs, and his contention that these remote terminals should be pushed further into the network so that they are closer to the end-users. (Ankum Rebuttal, pp. 8 and 6). If this were done, either in the real network or in the modeled network, the average DLC size would necessarily decrease. As I explain below, the use of a 6:1 concentration ratio has no effect on the number of DS-1s required to serve small DLCs. Consequently, pushing DLCs further into the network decreases the average realized concentration ratio, and is contrary to Dr. Ankum's proposal to use 6:1 concentration everywhere.

The second inconsistency in Dr. Ankum's rebuttal testimony relates to his recommendation that remote terminals be pushed further in the network, and to his criticism of Verizon's unbundled DS-1 study. (Ankum Rebuttal, pp. 59 and 62). Dr. Ankum's main complaint concerning Verizon's unbundled DS-1 study is that the fill factor used to develop the cost for the 28 DS-1 fiber system is too low. However, as I explain below, this fill factor is based on Verizon's actual experience in placing these systems close to end-user locations. Dr. Ankum is trying to have it both ways: he levies an unsupported criticism against the DLC placement underlying the unbundled loop costs, and then complains about the fill factors that result when remote terminals are pushed further into the network.

The third inconsistency concerns Dr. Ankum's position that integrated digital loop carriers (IDLCs) should be used when modeling an unbundled loop. (Ankum Rebuttal, p. 51). As I explain below, all of the hypothetically viable IDLC unbundling solutions require that the traffic be delivered at a DS-1 level. This means that in order to provision completely utilized DS-1s to an ALEC, the number of unbundled loops that an ALEC orders out of a given DLC must be a multiple of 24. This is an outcome whose likelihood decreases with the size of the DLC and with increases in the number of ALECs. Consequently, Dr. Ankum's proposal to model IDLCs would increase the number of DS-1s required for each IDLC. This in turn decreases the realized concentration ratio and is again contrary to his proposal that a 6:1 concentration ratio be used everywhere.

The fourth inconsistency exists between his recommendations that the Commission adopt the FCC's depreciation lives, and that the modeled network assume complete replacement of existing switches with the most current technology. (Ankum Rebuttal, pp. 107 and 84) If it were true that an efficient and rational carrier would replace all of its existing switches with the most current technology, then the required depreciation life for digital switches would be much shorter than the 12 to 18 years prescribed by the FCC and advocated by Dr. Ankum. Indeed, the depreciation life would have to be shorter than the 10 years sponsored by Mr. Sovereign in his direct testimony.

The fifth inconsistency exists between Dr. Ankum's recommendation that all of Verizon's GTD-5 switches be replaced and his recommendation that only cutover prices for initial switch placements be used to model switch costs. (Ankum Rebuttal, pp. 75-78). On the surface, it seems to make sense that, if the GTD-5 switches were replaced, then Dr. Ankum's claimed cutover prices would be appropriate. This hasty conclusion, however, fails to consider the ability of Verizon's other switch vendors to build, deliver and install the required replacement switches within a short timeframe. For Verizon, this would involve replacing the switches in 72 out of 90 wire centers in Florida. The problem is further complicated by the need to replace exiting host/remote complexes simultaneously, without any service disruptions. Presumably, if the wholesale replacement of the GTD-5 switches is the correct course of action for Verizon in Florida, then it is the correct action for the entire former GTE footprint. In my opinion, the demands put on the other switch vendors and on Verizon make it unlikely that existing switch prices could be obtained under Dr. Ankum's view of what constitutes a proper TELRIC study. Dr. Ankum's insistence on cutover prices is in direct conflict with his insistence that Verizon's costs be modeled as if all GTD-5 switches were replaced.

Q. WHAT UNSUPPORTED STATEMENTS AND RECOMMENDATIONS HAS DR. ANKUM MADE IN HIS REBUTTAL TESTIMONY?

A. Dr. Ankum's Exhibit No. AHA-6 presents his recommendations for the fill factors for several components of the local network. While he has offered arguments (albeit unconvincing ones) for some of these fills, the recommendation for conduit simply appears in this schedule with no supporting discussion whatsoever in his rebuttal testimony. Dr. Ankum's recommendation for drop lengths is, likewise, just a summary conclusion that the lengths he recommends are appropriate. (Ankum Rebuttal, p.57).

Dr. Ankum claims, incorrectly, that the drop is a very expensive portion of the loop in ICM-FL. (Ankum Rebuttal, p. 39). He does not support this statement in any way whatsoever, although ICM-FL offers him an easy avenue to do so. It is possible to set ICM-FL's minimum and maximum average drop length to one via the run time options screen, effectively setting the length of all drop wires and entrance facilities to one foot. When this is done, the TELRIC for the 2-wire loop decreases from $22.94 to $22.00 -- a decrease of less than one dollar. While this is not an insignificant amount, it hardly supports Dr. Ankum's claim that the "drop is a very expensive portion of the loop in ICM" or that ICM-FL assumes excessively long drops.

Finally, Dr. Ankum contends, without support, that the objective fill for feeder is 90 percent. (Ankum Rebuttal, p. 40). It is not clear what this means, since Dr. Ankum apparently defines "objective fill" differently than do other industry participants, including AT&T witnesses. The response to Verizon Interrogatory Number 9 gave the following definition of "objective fill":

> The fill that can be sustained on a facility permanently, accounting for maintenance, and administration, but not future growth in customers for ultimate demand.

In the past, AT&T witnesses have given a very different definition of "objective fill." In response to US West Data Request Number 6, in a Washington UNE proceeding (Docket Nos. WUTC-960369, -370, -371), AT&T witness John Klick defined objective fill as follows:

> Objective fill is the approximate utilization level at which an engineer begins looking at reinforcing the network to account

for growth in demand. This fill includes the spare capacity needed for breakage, testing and administrative, and limited growth. AT&T used the objective fill factor suggested by the Commission in this proceeding.

In the same proceeding, AT&T witness Dean Fassett equated objective fill with "fill at relief" and defined this as "the fill factor or percent utilization which will trigger the engineer to study whether relief is necessary." (Direct Testimony of Dean Fassett, p. 15). Thus, not only is Dr. Ankum's statement that the objective fill for feeder is 90 percent unsupported, but his definition of "objective fill" is unsupported as well.

Q. WHAT MISSTATEMENTS OF FACT HAS DR. ANKUM MADE IN HIS REBUTTAL TESTIMONY?

A. I found eight worth mentioning here. First Dr. Ankum erroneously states that "use of a secondary SAI (serving area interface) increases the use of copper facilities." (Ankum Rebuttal, p. 7). If Dr. Ankum understood the purpose of an SAI, he would know that this cannot be the case. For example, suppose that there are three 50-pair copper cables, each serving 26 customers and that each of these cables meets at an SAI as we trace their route from the end-users to the wire center. The SAI, also called a cross-connect box, allows the three 50-pair cables to be terminated, with their working loops being served by one or more larger cables. In this example, beyond the SAI, the 78 working lines would be served by a single 100-pair cable, instead of the three 50-pair cables.

Thus, it is clear that SAIs reduce the amount of copper cable needed in the network.

Second, Dr. Ankum asserts that Verizon's model assumes that customers are equally distributed throughout a fixed arbitrary grid and that the model builds plant to locations where no customers exist. (Ankum Rebuttal, pp. 8 and 58). This is not true. ICM-FL models the amount of copper distribution and feeder plant based on the amount of road feet in a given wire center, where the road feet measure includes <u>only</u> those types of roads along which one would expect end users to be located. Moreover, as I just noted, the total modeled sheath feet is more than 20 percent less than the sheath feet in the existing network. This is hardly the result one would expect if ICM-FL built plant to locations where no customers exist.

Third, Dr. Ankum states that Verizon's common cost study is conducted externally to ICM-FL. (Ankum Rebuttal, p. 36). This is not accurate, since the identification of Verizon's common costs goes hand in hand with the development ICM-FL's modeled expenses. Even though Dr. Ankum does not address common costs in his rebuttal testimony, this point is worth noting to highlight the linkage between ICM-FL and the common cost allocator sponsored by Verizon witness Dennis Trimble. Many of Dr. Ankum's recommendations, if implemented, would decrease the direct costs modeled by ICM-FL. Such changes would require a recalculation of the common cost allocator to account for the decrease in the denominator of the common-to-direct cost ratio.

Fourth, Dr. Ankum states that ICM-FL places DLCs beyond a predetermined fiber-copper crossover point, and that in many instances the DLC equipment only serves a few customers. (Ankum Rebuttal, p. 27). Again, this is not true. As I explained above, and in my direct testimony, ICM-FL does not use a copper loop-length restriction to determine the number or locations of DLCs. (Tucek Direct, p. 3). Moreover, except for the smallest DLC size (24 lines), the DLCs modeled by ICM-FL have an average fill in excess of 70 percent -- overall the DLC fill equals 95 percent. Finally, ICM-FL only models eight 24-line DLCs in Verizon's entire Florida network. Setting the material and placement costs associated with these DLCs to zero decreases the statewide average 2-wire loop TELRIC by less than a penny.

Fifth, Dr. Ankum states that ICM-FL places three drops to every residential unit. (Ankum Rebuttal, p. 38). In response to Verizon Interrogatory 8 asking for support of this statement, the ALEC Coalition pointed to pages 13-15 of Book II of ICM-FL's Model Methodology. However, the cited documentation makes it clear that ICM-FL places only one drop to each residential location:

> If the number of residential units in a demand unit is less than 500, then single family dwellings with drop wires are assumed. User input determines the size of the drop wire (3 or 5 pair). The 500-line threshold is also a user input. The

number of drop wires is equal to the number of residential units. (ICM Model Methodology, Release ICM-FL, Loop Module, Book II of VII, p. 13.)

Clearly, Dr. Ankum has confused a 3-pair drop with three individual drops. Since the "number of drop wires is equal to the number of residential units," it is impossible for ICM-FL to model three drops for each residential unit as Dr. Ankum claims.

Sixth, Dr. Ankum presents a fabricated example in which he portrays the total cost of a DLC to remain unchanged, even though the number of lines served increases. (Ankum Rebuttal, p. 52). This is not an accurate representation of DLC costs. As the number of lines served by a DLC is increased, the total cost will increase because, among other things, additional line cards will be needed, the required cabinet size increases, and the site preparation costs may change.

Seventh, Dr. Ankum incorrectly states that the GTD-5 is "produced" by GTE. (Ankum Rebuttal, p. 74). This is not true. The GTD-5 is manufactured by AGCS, Inc., which is a subsidiary of Lucent. This is easily verified by visiting AGCS's web site at "http://www.agcs.com/".

Finally, Dr. Ankum claims that "Verizon has based its switching studies on the discounts that it will receive for growth lines. ....As such, Verizon appears to ignore large numbers of facilities that would receive the large discounts if and when switches are newly installed." (Ankum Rebuttal, p. 77). In support of this position, he cites my direct testimony at page 6, lines 8-11. However, that portion of my testimony states:

> In particular, the switching costs produced by ICM-FL are based on the host/remote relationships and technology mix found in Verizon's network, and on the switch prices that Verizon is able to obtain today and for the foreseeable future.

Moreover, at page 17, lines 8-13, of my direct testimony, I state:

> The Switch Module calculates the investment needed to provide the circuit connections for completing telephone calls. The switch module designs a network based on Verizon's existing wire center locations, host/remote relationships, and the digital switch types that Verizon deploys in its network. *Costs are based on the current prices Verizon pays for initial switch placements and expansions. (Emphasis added.)*

I cannot speculate on the reasons why Dr. Ankum's rebuttal testimony contains these misstatements, but it is important that the Commission has an accurate understanding of the facts so that its evidentiary record is reliable.

DR. ANKUM'S SPECIFIC ALLEGATIONS AND RECOMMENDATIONS ARE FLAWED

Q. WHAT PORTIONS OF DR. ANKUM'S REBUTTAL TESTIMONY DOES THIS SECTION OF YOUR SURREBUTTAL TESTIMONY ADDRESS?

A. This portion of my surrebuttal testimony addresses the specific allegations and recommendations Dr. Ankum makes with respect to Verizon's recurring cost study. In particular, I address the following issues:

(1) Dr. Ankum's claim that Verizon's cost studies should reflect the post-merger environment;

(2) Dr. Ankum's charge that ICM-FL is not open and auditable;

(3) Dr. Ankum's recommendations concerning fill factors and growth capacity;

(4) Dr. Ankum's claims concerning the use of IDLCs and the GR 303 interface to unbundle loops;

(5) Dr. Ankum's recommendation that a 6:1 concentration ratio be assumed for ICM-FL's modeled DLCs;

(6) Dr. Ankum's allegation that ICM-FL's modeled drop lengths are too long;

(7) Dr. Ankum's criticisms of ICM-FL's modeling of customer locations;

(8) Dr. Ankum's claim that ICM-FL does not take advantage of the efficiencies of fiber facilities;

(9) Dr. Ankum's allegations concerning DLC placement costs;

(10) Dr. Ankum's allegations concerning Verizon's cost study for unbundled DS-1 loops;

(11) Dr. Ankum's claim that Verizon should file a cost study for EELs;

(12) Dr. Ankum's claim that the GTD-5 is not a forward-looking switch;

(13) Dr. Ankum's recommendations concerning the switch pricing used to model switch costs; and,

(14) Dr. Ankum's claim that feature costs are not usage-sensitive and should be recovered on a flat-rate basis.

With respect to issue (1), I also respond to Mr. Fischer's claim that the common cost factor used by Verizon in this proceeding should reflect the savings anticipated from the merger between Bell Atlantic and GTE.

Finally, in discussing many of these issues below, I report the cost estimates produced by ICM-FL if the modifications consistent with Dr. Ankum's recommendations are made. I report these results only to quantify the relative importance of Dr. Ankum's recommendations for the Commission. The fact that the results are presented in my surrebuttal testimony does not imply that I or Verizon endorse any of Dr. Ankum's recommendations.

Merger-Related Savings

Q. PLEASE COMMENT ON DR. ANKUM'S CLAIM THAT VERIZON'S

COST STUDY SHOULD REFLECT THE POST-MERGER ENVIRONMENT.

A. Dr. Ankum makes this claim at several places in his rebuttal testimony. At page 6, he claims that Verizon Florida should be able to capitalize on the efficiencies of scale and scope afforded by the size of the largest ILEC in the country. At page 12, he enjoins the Commission to evaluate Verizon's cost studies against the "standards that applys [sic] *to Verizon as the nations'* [sic] *largest ILEC*." At page 16 of his rebuttal testimony, Dr. Ankum states that "the old practice of protecting GTE as a smaller and more rural company is no longer appropriate."

I am not aware of any instance in which this Commission has protected GTE as "a smaller and more rural company." Additionally, the number of wire centers and lines served by Verizon in Florida has not changed as a result of the merger, nor have the local markets in which Verizon purchases labor. At least with respect to local operations, there have been no increased economies of scope and scale.

Q. IS IT REASONABLE TO EXPECT THAT THE SAVINGS FROM THE MERGER COULD BE IMMEDIATELY REALIZED UPON THE MERGER'S COMPLETION?

A. No. The savings resulting from the merger were not expected to be achieved immediately. Page 3 of Mr. Fischer's exhibit WRF-6 makes it clear that the merger savings were not expected to be realized until three years after the merger's completion. The merger transaction was not closed until July, 2000.

Q. DOES VERIZON'S COST STUDY REFLECT AN ADJUSTMENT FOR THE SAVINGS RESULTING FROM THE MERGER BETWEEN GTE AND BELL ATLANTIC?

A. Yes. The expense inputs for ICM-FL reflect a downward adjustment of $36.4 million in merger-related expense savings. This adjustment is shown in the schedule labeled Attachment I.a.5 in the "Section 5.pdf" file contained in Verizon's cost study filing. More than half of this amount is a reduction in the common costs modeled by ICM-FL -- without the adjustment for the merger savings, the fixed allocator would be almost 150 basis points higher. Consequently, Mr. Fischer's claim that Verizon's common costs should be adjusted to reflect the benefits of the Bell Atlantic / GTE merger are unfounded. (Fischer Rebuttal, pp. 23-24).

ICM-FL Is Open and Auditable

Q. IS DR. ANKUM CORRECT WHEN HE CLAIMS THAT ICM-FL IS NOT OPEN AND AUDITABLE?

A. No. Dr. Ankum acknowledges that he has access to ICM-FL's code, but claims that the model is not sufficiently flexible to allow model auditing and inputting of different assumptions. (Ankum Rebuttal, p. 26) Nothing could be further from the truth. Nearly all of ICM-FL's inputs are user-adjustable, including material and placement costs, cable and DLC sizes, the ratio of installed-to-working lines, the amount of administrative fill, depreciation lives, the cost of money, and the minimum and maximum average drop lengths. As I explain below, ICM-FL is sufficiently flexible to see the impact of Mr. Fischer's recommendations concerning the C. A. Turner indices. Even the size of the drop can be changed to 2 pairs as Dr. Ankum recommends in his rebuttal testimony: one need only populate the input for the cost of a 5-pair drop with the corresponding 2-pair drop cost and run the model with the 5-pair option selected. (I report the results of this exercise below, in my discussion of Dr. Ankum's recommendations for drop costs.) In short, Dr. Ankum's claim that it is not possible to vary the inputs and compare the outcomes of various scenarios is simply not true.

Q. SHORT OF MODIFYING THE CODE, IS IT POSSIBLE TO VARY EVERY INPUT AND ASSUMPTION CONTAINED WITHIN ICM-FL?

A. No. But such a standard of flexibility is substantially more stringent than AT&T and MCI have advocated in the past. For example, in a previous UNE proceeding in Washington, AT&T/MCI witness Mercer implied that AT&T's Hatfield Model was superior because it had "many tens of thousands of inputs" even though there were only around 660 inputs "specifically present[ed] for users to vary". (Docket Nos. WUTC-960369, -370, -371, *Hearing Transcripts* (July, 1997) at p. 371). Contrary to Dr. Ankum's apparent view, not every underlying input or assumption in a model needs to be user-adjustable in order for AT&T and MCI to support its use.

Q. IS DR. ANKUM'S COMPLAINT THAT ICM-FL IS NOT SPREADSHEET BASED LEGITIMATE?

A. No. ICM-FL is a code-based model written in Delphi Pascal, which is a commercially available development environment for Windows-based Pascal applications. It may be true that Dr. Ankum does not have the ability or expertise to modify ICM-FL's code, but this does not mean that none of the employees or consultants of AT&T, MCI or other members of the ALEC Coalition do not. The code has been made available in both PDF and text file form, and the skills and other resources needed to modify it are easily obtained on the open market.

More to the point, Dr. Ankum's complaint about ICM-FL's code-based platform is belied by AT&T's own actions. The model sponsored by BellSouth in this proceeding has a mixed code- and spreadsheet-based platform, utilizing C^{++}, Visual Basic, and Excel. While AT&T has voiced some concerns about BellSouth's model, it is my understanding that they have not complained about the code-based portions of the model specifically on the grounds that they are code-based. Similarly, AT&T and MCI WorldCom have sponsored a modified version of the FCC's federal universal service cost model (HCPM or Synthesis Model) in UNE proceedings in Virginia, Maryland and Pennsylvania. This is significant because AT&T has modified the coding in the loop portion of the model -- a portion that has a code-based platform utilizing Turbo Pascal -- allegedly to make the model UNE compliant. (Turbo Pascal is an outdated Pascal development environment that is no longer commercially available in the United States. The manufacturer, Borland, recommends Delphi Pascal for Windows applications.) The fact that a model's platform is code-based certainly has not prevented some members of the ALEC Coalition from advocating its use when it suited their purposes.

Q. ARE THERE CRITICAL ASSUMPTIONS EMBEDDED IN ICM-FL'S CODE THAT DEAL WITH CONTROVERSIAL ISSUES AS DR. ANKUM CLAIMS?

A. No. I have participated in TELRIC proceedings since the fall of 1996. In my opinion, the controversial issues have been limited largely to the following topics:

(1) modeling of customer locations;

(2) assumptions regarding fill factors;

(3) inputs dealing with depreciation and the cost of money;

(4) inputs dealing with placement and material costs; and

(5) network design assumptions.

I discuss issues (1) and (2) below and show that, with one exception, the assumptions are not embedded in ICM-FL's code. The inputs at issue in items (3) and (4) are easily adjustable in ICM-FL. With respect to item (5), the disagreement generally focuses on the assumed level of structure sharing, the DLC configuration modeled in a UNE environment, and on the switching technology used. The level of structure sharing in ICM-FL is determined by user inputs changed via the run time options screen, and is not embedded in ICM-FL's code. Similarly, the DLC and switching technology inputs are not embedded in ICM-FL's code. Dr. Ankum will no doubt disagree with me on what a list of controversial issues should include. I note, however, that in response to Verizon's interrogatories, the ALEC Coalition declined to identify any issues beyond those mentioned in Dr. Ankum's testimony and did not characterize any as "controversial."

Dr. Ankum's Fill Factor Recommendations Should Not Be Adopted

Q. SHOULD THE COMMISSION ACCEPT DR. ANKUM'S RECOMMENDATIONS REGARDING FILL FACTORS?

A. No. As I noted earlier, Dr. Ankum's recommended fills are very high -- he would have this Commission base costs on a network operating close to capacity. More important, Dr. Ankum seems to labor under the incorrect assumption that ICM-FL contains hidden calculations that rely on the fills for distribution, feeder, drops, COTs, RTs, channel units and conduit to size telecommunications plant and calculate costs. He seems to not understand that, for example, the distribution fills reported by ICM are results and not inputs. (The distribution and feeder fills reported by ICM-FL are calculated as described in Verizon's response to Staff Data Request 75; this response was provided at the time Verizon's cost study was filed.) The only fill factor input that ICM-FL's loop module relies upon is an administrative fill input of 0.98, which allows 2 percent fill for administrative spare. Additionally, the development of the DLC material inputs for line cards is based on provision for 4.76 percent administrative spare. Both of these fill factors can be changed, either directly via the run time options screen or by modifying the per-line inputs for DLCs in ICM-FL's material inputs table. Finally, entrance cables are sized based on an assumed fill of 50 percent. While this assumption is embedded in ICM-FL's code, it is possible to change it by modifying the material inputs table.

Q. HAVE AT&T AND MCI SPONSORED A MODEL THAT PRODUCES FILL FACTORS THAT ARE MUCH DIFFERENT THAN THOSE RECOMMENDED BY DR. ANKUM?

A. Yes, but not in this proceeding. In other states, and in Florida Docket Number 980696-TP, AT&T and MCI have sponsored the HAI Model (also known as the Hatfield Model). The HAI Model sizes cable based on cable-sizing inputs that range from a low of 50 percent to a high of 75 percent for distribution cable, and from 65 to 80 percent for copper feeder cable. The model sizes cable by dividing the required demand by the sizing input, and then modeling the cost of the next largest cable size. The resulting effective fill factors are about two-thirds of the cable sizing input. For example, if the sizing input were 75 percent, and a cable to serve 39 customers were needed, a 100-pair cable would be chosen and the resulting fill would be 39 percent. Since the maximum cable sizing factor used in the HAI Model is 80 percent, it is clear that Dr. Ankum's recommended fill factors -- at least for distribution and copper feeder cables -- are substantially higher than those espoused by AT&T and MCI in other proceedings. Indeed, in Verizon's Massachusetts UNE proceeding (Case Number DTE 01-20 (Part A)), AT&T witness John Donovan testified that the HAI Model produced an average effective of fill of 48.3 percent for Verizon's Massachusetts network. (Direct Testimony of John C. Donovan, May 1, 2001, p. 20.)

Q. HOW DOES ICM-FL SIZE THE LOCAL OSP NETWORK?

A. Besides the administrative fill input I just mentioned, ICM relies on two inputs that can be changed via the run time options screen. These inputs are called the engineering factors for distribution and feeder, and can be thought of as the ratio of installed to working lines. In Verizon's filing, they take the values of 2.16 and 1.011, respectively. (The derivation of these factors can be found in the files "DISTFACT.xls" and "ENGFEEDER FACTOR.xls" on the CD-ROM containing Verizon's cost study.) Suppose, for example, that 40 working lines are needed for a given distribution cable. ICM-FL will determine that 86.4 (40 x 2.16) pairs are needed, and install the next largest size cable, a 100-pair cable. Since 86.4/100 is less than the administrative fill input of 0.98, no cable-size adjustment for administrative spare is needed. (If 98, 99, or 100 pairs were needed, the next largest size cable would be used.) Copper feeder cables are sized in the same way, with the feeder engineering factor being used instead. The feeder engineering factor is also used to determine the size of the DLC modeled by ICM-FL. For example, if a given DLC serves 80 working lines, ICM-FL determines that the DLC must be big enough to accommodate 80.88 lines and installs the next largest size -- in this case, a 96-line DLC. The administrative fill input of

0.98 is not used in sizing the DLCs.

Q. DO THE ENGINEERING FACTORS FOR DISTRIBUTION AND FEEDER PLANT REFLECT THE NEED TO ACCOMMODATE FUTURE DEMAND?

A. Yes. ICM-FL's distribution engineering factor is based on an assumption of placing 2.36 pairs per lot, which is consistent with Verizon's guideline of 2.0 to 2.5 pairs per lot. The feeder engineering factor is based on the forecasted growth in access lines over a 4-year period -- the factor reflects one-half of this growth to correspond to the midpoint of this period.

Q. IS DR. ANKUM CORRECT WHEN HE SAYS, AT PAGE 36 OF HIS REBUTTAL TESTIMONY, THAT CURRENT USERS SHOULD NOT PAY FOR CAPACITY INSTALLED TO SERVE FUTURE DEMAND?

A. No. Dr. Ankum's argument suffers from a major fallacy -- it overlooks the fact that growth in customer demand is an ongoing process. Existing customers benefit from the prior provision of spare capacity since it enables Verizon to meet demand as it occurs in a cost-effective manner. Consider the consequences of excluding the cost of spare capacity from the rates charged current customers, whether they are ALECs or end-users. For simplicity, assume that there were no other costs to be recovered other than the TELRIC (or the TSLRIC in the case of end-users) so that setting rates equal to direct cost ensures that the total cost of the network is recovered. If the rates charged today's customers do not reflect the costs of today's spare capacity, then these costs either will not be recovered or will be recovered by future customers. However, the latter outcome would only be possible if the rates charged to a customer were based on the date the customer subscribed to the network -- in other words, if temporal deaveraging was used to set rates. Such a pricing scheme is obviously infeasible and must be rejected.

Q. HAVE OTHER AT&T WITNESSES TESTIFIED ON PROVIDING CAPACITY FOR FUTURE DEMAND?

A. Yes. In Massachusetts Department of Telecommunications and Energy Case Number DTE 01-20 (Part A), Dr. Robert A. Mercer testified on behalf of AT&T. On cross examination, Dr. Mercer was asked if the Department should consider the cost of serving tomorrow's demand and answered as follows:

> Any answer that I give -- and I will give -- I'll predicate with the fact that this has been an intense argument among economists on both sides of this issue. You know, the extreme in one direction says any growth that you build into the model essentially leads to what -- you're more an economist than I am -- an intergenerational transfer, in the sense that if you size the network to have any excess growth, you're essentially saying today's ratepayers, in the way these UNE rates are set -- today's ratepayers are going to be paying for customers that are going to be served tomorrow by that excess capacity.

The other extreme says, but from an engineering point of view I also understand that I can't go out and rebuild -- you know, I can't string two pairs on the poles every time I want to serve, you know, another two lines.

If you now look -- to go back to something Mr. Donovan was saying about riser cable. If you look at any reasonable percentage of, say, literally broken pairs, it's typically very small. Churn is typically a few percent. So when we're achieving a 48.4 percent fill, most of that, you're saying -- Let me not use that number, because that happens because of modularity. If I start even at 75 percent, I only needed a few percent to account for churn and for literally broken pairs. What's the rest of it? The rest is that the compromised position that we finally arrived at in the model was there had to be some amount provided for growth, because it was hard to explain why an engineer would go out and put in a bigger-than-necessary cable but a cost model should not.

So the model, even at the 75 percent sizing factor, the model has in it in fact a fair amount of capacity for growth, because otherwise you would be at more like what you asked a moment ago about objective fill, you would be at a level more like 85 or 90 percent, in order to ensure that the rates right

now were only paying for the demand that was serving the loops that are out there today.
(Case No. DTE 01-20 (Part A), *Hearing Transcripts* (February 5, 2002) at pp. 3045-3047; [*emphasis added*])

Even though Verizon and AT&T disagreed on the appropriate level of spare capacity in Massachusetts, AT&T's witnesses acknowledge that it is appropriate for a cost model to reflect the need to build capacity today to serve tomorrow's demand. It is unclear to me how this position is invalidated simply because the ALEC Coalition did not sponsor a model in the current proceeding.

Q. IS IT POSSIBLE TO ESTIMATE HOW MUCH OF THE 2-WIRE LOOP TELRIC IS DUE TO ICM-FL'S PROVISION FOR FUTURE DEMAND?

A. Yes. All one has to do is set the two engineering inputs I described above equal to one. Doing so produces the following results for the 2-wire loop TELRIC and the modeled fills for distribution and feeder plant:

	2-Wire Loop	**Dist Fill**	**Feeder Fill**
Factors=1:	$21.33	73.54%	94.55%
Filed:	$22.94	38.28%	93.59%
Change:	($ 1.61)	35.26%	0.96%

Note that even though the distribution fill nearly doubles, the cost per loop decreases by only 7 percent. The reason for this is that the accommodation for growth comes mainly through selection of larger copper cables -- the placement costs remain virtually unchanged between the two runs. Note also that setting these two inputs to one means distribution plant will be designed to accommodate only the existing number of working lines and that no provision for growth in the feeder network is provided for -- something no network engineer would ever do. Even if the filed inputs were deemed to be too high, any reasonable alternatives would still need to be greater than one, so that the changes shown above would necessarily be smaller. Indeed, on cross examination in the same Massachusetts UNE proceeding cited above, AT&T witness John C. Donovan testified that 1.6 to 2.0 pairs per living unit is the minimum design standard. (Case No. DTE (Part A), *Hearing Transcripts* (February 5, 2002) at p. 2868).

Q. DOES DR. ANKUM'S RECOMMENDATION THAT THE COST OF COPPER FEEDER CABLES BE BASED ON A 90 PERCENT FILL MAKE SENSE?

A. No. Dr. Ankum's recommendation is based on his unsupported assertion that copper feeder will not be reinforced, and that fiber facilities will be used instead. While it is true that a combination of fiber plus DLCs will replace copper feeder cables in some instances, it is too broad an assertion to say that it will happen everywhere in all cases. In any event, copper feeder facilities will still be needed to connect customers to the DLCs -- it is only the feeder routes between the DLCs and central office that are replaced with fiber, not *every* copper feeder facility. This is an important distinction because this is the network modeled by ICM-FL. The routes from the DLCs to the central office are assumed to be all fiber, and only the copper subfeeder needed to connect the distribution plant to the DLCs, or customers not served by DLCs to the central office, is modeled.

Q. SHOULD THE COMMISSION ADOPT DR. ANKUM'S RECOMMENDATION THAT ONLY 2-PAIR DROPS BE MODELED FOR INDIVIDUAL RESIDENCE AND BUSINESS UNITS?

A. No. Dr. Ankum offers no support for this recommendation other than his incorrect claim that the drop is a very expensive portion of the loop in ICM-FL. Verizon destandardized 2-pair drops in 1997 -- see the file "3wr_drp3.PDF" on the ICM-FL CD. ICM-FL's use of a 3-pair drop instead of a 2-pair drop reflects Verizon's actual operating practice and recognizes that many customers have more than one line. Once a subscriber orders a second line, use of a 2-pair drop means that a second drop must be placed if one of the pairs fails, or if a third line is ordered. Moreover, based on the cost differential between a 2-pair and 3-pair drop that existed in 1997, use of a 2-pair drop decreases the 2-wire loop TELRIC by only 4 cents. This minimal change reflects the fact that the drop placement costs do not change if a 2-pair drop is used. The small change also supports the use of a 3-pair drop since doing so reduces the likelihood of incurring the additional placement cost of installing a second drop at a customer's premises.

Q. DOES DR. ANKUM'S RECOMMENDATION THAT THE FILL FACTOR FOR THE 2-PAIR (OR 3-PAIR) DROPS BE SET NO LOWER THAN THE FILLS APPROVED FOR COPPER DISTRIBUTION MAKE SENSE?

A. No. Consider a 50-pair distribution cable that is serving 30 residential customers who have ordered only one line each. The fill on the distribution cable is obviously 60 percent (30/50), and the fill on each 2-pair drop can only be 50 percent. Suppose further that half of the 30 customers order a second line. The fill on the distribution cable increases to 90 percent (45/50), while the average fill on the drops is only 75 percent (45/(2x30)). This example illustrates a basic confusion underlying Dr. Ankum's fill factor recommendations. ICM-FL does not use fill-factor assumptions for individual components of the network to develop their costs so that they can be summed to develop the cost of the loop. Instead, ICM-FL sizes cables as I described earlier and chooses the required network components based on the discrete sizes available. This is the same approach followed by the HAI Model, by BCPM and by Sprint's and BellSouth's current models. This approach to modeling the network ensures that the individual network components "fit together" and generates the fill factors underlying the network, whether they are reported or not, in a consistent fashion.

Use of IDLCs In ICM-FL

Q. IS IT POSSIBLE TO UNBUNDLE LOOPS USING INTEGRATED DLCS WITHOUT CONVERTING FROM DIGITAL TO ANALOG AND TERMINATING THE UNBUNDLED LOOP AT THE MAIN DISTRIBUTION FRAME?

A. It is only possible in a hypothetical sense. Telcordia's *Notes on the Network* (October, 2000) describes four general approaches. In the first approach, a separate GR-303 Interface Group is used for each ALEC customer. This arrangement requires the unbundled loops to be handed off to the ALEC at a DS-1 level of service. In discussing this approach, Telcordia notes:

> This arrangement may be cost effective for those CLECs having a "critical mass" of subscribers served by the RDT or group of RDTs in a CEV. Since the GR-303 Interface Group supports operations functionality, there are a variety of issues (provisioning, alarm reporting, sharing of test resources, etc.) that are currently being addressed by the industry.
>
> (*Notes on the Network*, p. 12-55)

The issues inherent with multi-carrier operation noted by Telcordia are not trivial. They cannot be solved with only Operating Support System (OSS) or process changes. New and as yet undefined functional capabilities must be developed by both switch and DLC suppliers. Even if the ALEC is willing to allow Verizon to administer the RT, Verizon would have to connect its OSS to the ALEC switch, and maintain the ALEC circuit assignment data, in order to control the assignment of circuits in and through the ALEC switch. The ALEC would still need to control its switch, which means that a single switch would be driven by two separate and different OSS infrastructures. Moreover, the multi-carrier operation envisioned by this approach presents a set of security problems that would not otherwise exist, since the assignment and control information for the RT would flow through each connected switch. No switch or RT functionality currently exists to prevent one switch operator from interacting with other Verizon and ALEC loops provisioned in the same RT, whether this interaction is accidental or deliberate.

The second approach is a variation of the first, and involves using a TR-08 Interface Group for the ALEC traffic and a GR-303 interface for the ILEC traffic. However, the TR-08 interface only allows concentration in Mode II, in which 48 channels per DS-1 are provisioned. (*Notes on the Network*, p. 12-28). This produces a 2:1 concentration ratio, far less than Dr. Ankum's 6:1 recommended benchmark. Additionally, this arrangement requires that a group of 96 RT channels (or multiples of 96 channels) be dedicated to the ALEC, no matter how many loops are unbundled from a single RT. This is a different service than an unbundled loop, which is "a transmission facility between a distribution frame, or its equivalent, in an incumbent LEC central office, and the network interface device at the customer premises." (First Report and Order, ¶ 380). Finally, because this arrangement still involves delivering traffic to the ALEC at the DS-1 level, the "critical mass" issue noted above still applies and must be resolved at each RT site, not at a wire center level.

The third method described by Telcordia contemplates an entire RT being leased by the ALEC. (*Notes on the Network*, p. 12-57). Because ICM-FL sizes DLCs based on the entire demand at each DLC location, this option would necessarily increase the number of modeled DLCs and the reported costs, even if IDLCs were assumed. In addition, the modeled fill on the DLCs would decrease. Finally, the leasing of an entire RT is again a different service than provisioning an unbundled loop.

Lastly, Telcordia suggests that it is hypothetically feasible to share a GR-303 Interface Group and use the sidedoor port of the switch to transport ALEC traffic out of the ILEC switch. Under this arrangement, the ALEC circuits are provisioned as non-switched / non-locally switched circuits within the IDLC. Unless the ALEC is fully utilizing the DS-1 leaving the sidedoor port, a digital cross-connect will be needed to hand off the unbundled loops at a voice grade level. In discussing this option, Telcordia observed the following:

> The ILEC must address the following issues associated with the sidedoor port arrangement:

A. The cost of a DS1 switch termination for a sidedoor port is about ten times the cost for a DS1 line card on a RDT.

B. Since each CLEC circuit requires a nailed up DS0, the ILEC may encounter blocking over the IDLC system as other circuits compete for DS0 channels.

C. The number of sidedoor ports that can be engineered varies depending on the LDS supplier.

D. There is limited support in existing special services design systems and databases to support sidedoor port circuits.

E. The ILEC may need field visits to install special service D4 channel units at the RDT.

(*Notes on the Network*, p. 12-56. Note that "LDS" stands for the Local Digital Switching system.)

Q. FOR THE PURPOSE OF MODELING THE TELRIC OF AN UNBUNDLED LOOP SERVED BY A DLC, SHOULD AN INTEGRATED OR UNIVERSAL CONFIGURATION BE ASSUMED?

A. This question must really be answered in the context of what technology is commercially available today. As noted above, there are numerous issues to be resolved before such an integrated capability can be realized, including issues dealing with the desired configuration, software requirements, central office and RT surveillance and security capabilities, traffic engineering, and trouble/fault identification. Regardless of what is hypothetically feasible, the question of what DLC architecture a cost model should assume is dominated by the fact that no switch or NGDLC vendors have commercially offered products with the functionality required to support a multi-carrier operation of a GR-303 interface. Because TELRIC must be based on equipment and technology that is commercially available today, a universal DLC configuration is the correct assumption to make when modeling the TELRIC of an unbundled loop.

Q. IS IT POSSIBLE TO MODIFY ICM-FL TO UTILIZE INTEGRATED DLCS IN ESTIMATING COSTS?

A. Yes. If the "Retail" option is selected in the run time options screen, ICM-FL will model a network configured with IDLCs. The only thing else that needs to be done is to develop expense inputs that are consistent with this network configuration and that exclude the avoided retail costs. If this is done, the TELRIC for the 2-wire loop falls by $1.39 to $21.55 per month. All of the hypothetical solutions described above and three of the four solutions discussed in the MCI WorldCom paper (Ankum Exhibit AHA-8) require that at least an entire DS-1 be delivered to the ALEC. Again, this is a different service than an unbundled loop. (The fourth solution in the MCI WorldCom paper involves "hairpinning" the circuit through the sidedoor port as described earlier. The paper readily acknowledges that this is not an efficient arrangement since it unnecessarily and quickly consumes switch resources). This requires an increase in the number of DS-1s for each DLC, unless the ALEC unbundles customers in groups of 24 from *each* of the relevant DLCs. As

I noted earlier, this is an outcome whose likelihood decreases with the size of the DLC and with increases in the number of ALECs. Surrebuttal Exhibit DGT-2 provides an example of the phenomenon.

In this exhibit, I have assumed that three carriers are competing for customers in Verizon's network, under two market share scenarios. One of the carriers is Verizon, although it doesn't matter which of the three it is. For purposes of this example, requirements for channels needed for maintenance, alarms, etc., are ignored, and it is assumed that each DLC is 100 percent utilized. Scenario 1 assumes that the three carriers all have an equal chance of providing service to a given end-user. Scenario 2 assumes a more lop-sided distribution. The section at the bottom of page one of the exhibit shows the number of DS-1 circuits that would be required under two concentration ratios, based on the number of DLCs modeled by ICM-FL. Under both concentration ratios, the number of DS-1s increases -- with more competing carriers the increase would of course be greater. Consequently, even if loops could be unbundled from an IDLC, the resulting decrease in the 2-wire TELRIC would be less than the $1.39 discussed above.

Dr. Ankum's Recommended 6:1 Concentration Ratio Should Not Be Adopted

Q. **WHAT CONCENTRATION RATIO IS ASSUMED IN ICM-FL?**

A. The DLC inputs used by ICM-FL are a based on a 4:1 concentration ratio.

Q. SHOULD THE COMMISSION ADOPT DR. ANKUM'S RECOMMENDATION FOR A 6:1 CONCENTRATION RATIO?

A. No. As discussed above, Dr. Ankum's fabricated example at page 52 of his rebuttal testimony is based on the incorrect assumption that the cost of the DLC remains the same even though the number of end-users served increases. Consequently, the decreases in the cost per voice grade channel (or DS-0) shown in Dr. Ankum's table are misleading. Moreover, moving from a 4:1 to a 6:1 concentration ratio has no impact on the number of DS-1 links required for 192-line DLCs and smaller. (See Surrebuttal Exhibit DGT-3.) Finally, in recommending a 6:1 concentration ratio, Dr. Ankum has given no consideration to the resulting increase in the blocking probability.

Q. IS IT POSSIBLE TO MODIFY ICM-FL'S DLC INPUTS TO REFLECT A 6:1 CONCENTRATION RATIO?

A. Yes. The only investment that is affected is in the DSX-1 panel and the associated cards. In the universal configuration underlying Verizon's filed costs, there is no change in the investment or in the resulting 2-wire loop TELRIC. If a 6:1 concentration ratio is used with the inputs for the integrated arrangement in the run I just described, the resulting 2-wire loop TELRIC is $21.54, a decrease of only one cent. Thus, the difference between the 4:1 and 6:1 concentration ratio is substantially smaller than Dr. Ankum would have this Commission believe.

ICM-FL's Drop Lengths

Q. SHOULD THE COMMISSION ACCEPT DR. ANKUM'S RECOMMENDATION FOR MODELED DROP LENGTHS?

A. No. Dr. Ankum's recommended drop lengths are unsupported by his testimony, or by any other portion of the record in this proceeding. Moreover, his recommendation to specify a drop length for each deaveraged zone does not make sense. In order to determine the composition of the zones, one must know the loop costs for each wire center. This cannot be done without first determining the modeled drop length. As I explain below, ICM-FL determines the average drop length based on the characteristics of the individual demand point, or grid. This means that grids which have similar density characteristics will have similar average drop lengths, regardless of the zone their particular wire center is ultimately assigned to.

Q. HOW DOES ICM-FL MODEL THE DROP LENGTH FOR A GIVEN DEMAND POINT OR GRID?

A. The average drop length is determined by the number of business and residential units in each grid and by an assumed grid area of 2.7 million square feet. (As noted in the response to Staff Interrogatory 141, Set Six, this assumed grid area is less than the average grid area in ICM-FL, so that using the assumed area results in shorter drop lengths.) The number of business and residential units is determined by dividing the business and residence lines by the number of lines per unit. The number of lines per unit for businesses and residences are user-adjustable inputs that are specified via ICM-FL's run time options screen. Dividing the grid area by the total number of units produces the average size lot for the grid, including streets, sidewalks, shoulders, and right-of-way areas. ICM-FL assumes that the lot is square and calculates the average drop length for the grid as the distance from the center to the corner. This approach recognizes both front and back placement of drops and accounts for the fact that many drops must cross the street to reach the distribution cable. Because the calculations just described can result in unusually long or short drop lengths in sparsely or densely populated grids, ICM-FL allows the user to specify maximum and minimum values for the modeled average drop length.

Q. DOES ICM-FL REPORT THE AVERAGE MODELED DROP LENGTH?

A. No, but it is possible to extract the records corresponding to the populated demand points or grids to an Excel file and calculate the average drop length modeled by ICM-FL. Based on the inputs filed in Verizon's cost study, the average modeled drop length is 102.7 feet. Because one drop can serve more than one line, the average is only 73.3 feet per line.

Q. HOW DO THE MODELED DROP LENGTHS COMPARE TO DR. ANKUM'S RECOMMENDED LENGTHS FOR EACH ZONE?

A. ICM-FL models drops that are longer than Dr. Ankum's unsupported recommendation, as shown in the table below:

	Zone 1	Zone 2	Zone 3	Overall
Filed:	81.8	129.0	259.0	102.7
Dr. Ankum:	75.0	100.0	150.0	85.5

Q. IS IT POSSIBLE TO FORCE THE AVERAGE DROP LENGTHS IN EACH ZONE TO EQUAL THE VALUES RECOMMENDED BY DR. ANKUM?

A. No. However, one can lower the values for minimum and maximum average drop length and decrease the average length of the modeled drop in each zone. The average modeled drop length is not particularly sensitive to reductions in the minimum average drop length -- setting it to 10 only reduces the average Zone 1 drop length to 81.2 feet, and does not change the average for the other two zones. If the input for the maximum average drop length is decreased to 165, the following average drop lengths are obtained:

Zone 1	Zone 2	Zone 3	Overall
79.2	109.6	149.5	91.5

As is shown above, setting the maximum average drop length to 165, forces the average drop lengths for each zone close to Dr. Ankum's unsupported recommendations. Overall, the average modeled drop length decreases by 11 percent.

Q. WHAT IMPACT DOES THIS INPUT CHANGE HAVE ON THE AVERAGE TELRIC FOR THE 2-WIRE LOOP?

A. The results by zone and overall are shown in the table below:

	Zone 1	Zone 2	Zone 3	Overall
Filed:	$18.94	$27.68	$74.16	$22.94
Max=165:	$18.92	$27.47	$72.86	$22.84
Decrease:	($ 0.01)	($ 0.20)	($ 1.31)	($ 0.10)

Thus, moving ICM-FL's average modeled drop lengths substantially towards Dr. Ankum's recommendation has very little impact on the resulting cost estimates. As I explained earlier, drop costs are not a very expensive part of the loop in ICM-FL -- an 11 percent decrease in length results in a less than one-half of one percent decrease in the 2-wire loop TELRIC.

ICM-FL's Modeling of Customer Locations

Q. HOW DOES ICM-FL MODEL CUSTOMER LOCATIONS?

A. As I explained at page 22 of my direct testimony, ICM-FL utilizes a very small grid area, called a demand point, along with information on road feet, and estimates of access lines by census blocks obtained from PNR Associates. The line count estimates for each census block are assigned to each demand point based on its share of the road feet in the census block. The road feet measure corresponds to the types of roads along which residential or business development would normally occur, and from which customers would have access to their premises. The measure excludes interstate highways, limited access roads, bridges, tunnels, access ramps, and motorcycle trails because these are not roads along which customers typically are located. Alleys and driveways are also excluded because including them would overstate the amount of road feet along which telephone plant is placed. The demand units are assigned to each wire center based on Verizon's tariffed exchange boundaries. The resulting totals for each wire center are trued up to Verizon's actual line counts by wire center so that the sums of the residential and business line counts for the demand units in a wire center equal the actual totals for that wire center.

Q. DOES ICM-FL ASSUME THAT CUSTOMERS ARE EQUALLY DISTRIBUTED THROUGHOUT EACH GRID AS DR. ANKUM CLAIMS?

A. No. ICM-FL uses the lines and road feet for each grid to model the cost of the copper distribution plant needed to serve the customers based on the user inputs in the FLtemplt.db table. The total amount of copper and fiber feeder in a wire center is constrained by the amount of road feet in the wire center. Again, the road feet measure only includes those roads along which residential or business development would normally occur.

Q. IS GEOCODING OF CUSTOMER LOCATIONS THE PANACEA THAT DR. ANKUM SUGGESTS IT IS?

A. No. One of the major problems with geocoding is that it is a very expensive undertaking, so much so that the geocoded locations underlying Dr. Ankum's HAI benchmark have not been updated even though they are based on a 1997 address list from Metromail. Additionally, the success rate associated with geocoding is substantially less than 100 percent. For Florida, the HAI Model's success rate ranges from 34 to 85 percent depending on the density zone. For the two most dense zones, the success rate is 50 percent or less. For the state overall, the average success rate is only 70 percent. This average reflects a low of 55 percent for BellSouth, and a high of 79 percent for Verizon.

Q. WHY IS THE GEOCODING SUCCESS RATE A SOURCE OF CONCERN?

A. A geocoding success rate of less than 100 percent forces the model developers to manufacture surrogate geocoded locations for the residential and business customers who were not successfully geocoded. The HAI Model developers have used two methods to manufacture these surrogate locations. At one time, they assumed that the surrogate locations would be uniformly distributed along census block boundaries. They now assume that the surrogate locations will be uniformly distributed along the roads within a census block.

Both of these solutions present their own problems. By distributing the manufactured locations along census block boundaries, the model developers are placing customers where roads may or may not exist since such census blocks are often bordered by political boundaries, rivers or railroad tracks. The more recent device of placing the surrogate locations uniformly along the road network will result in customers being "located" between existing houses and business locations. Also, one source of geocoding failure is the inability to assign latitudes and longitudes to addresses consisting of a post office box or a rural route -- the surrogate locations for these subscribers will line up with the actual locations only by chance. Consequently, it is almost a certainty that Dr. Ankum's HAI standard is building plant to locations where no customers exist, the very charge he has leveled against ICM-FL. Clearly, failure to geocode customer locations with sufficient accuracy can lead to suspect and inferior results.

Q. IS THERE ANY OTHER REASON WHY USE OF GEOCODED DATA MIGHT PRODUCE INFERIOR RESULTS?

A. Yes. Use of geocoded data -- even with a 100 percent success rate -- adds little to a model if the detail is thrown away before the modeled network is built. This is what Dr. Ankum's HAI benchmark does. The basic unit of analysis in the HAI Model is the "cluster" which is a rectangular area in which the customer locations are effectively assumed to be evenly distributed. The cluster is the most granular level of location information for which the HAI Model designs outside plant. In Massachusetts, the HAI Model utilized less than 4,700 clusters to design a network supporting nearly 4.5 million lines. In Florida, the HAI Model uses less than 2,100 clusters to model Verizon's network. By comparison, ICM-FL utilizes more than 23,000 of the demand points I described above to design a network supporting almost 2.5 million lines.

Q. IS IT POSSIBLE TO USE GEOCODED DATA IN ICM-FL?

A. Yes. Assuming that one had a database containing the geocoded location for each of Verizon's Florida customers, it would be possible to map those locations to the 1/200th by 1/200th of a degree grid structure used by ICM-FL. While this is not an easy task, it is clear the ICM-FL's customer location assumptions are not embedded in the model's code.

Q. HAS BELLSOUTH PROVIDED A MODEL OF THEIR NETWORK THAT RELIES ON GEOCODED INFORMATION?

A. Yes, they have. With respect to the granularity issue, BellSouth's model is superior to the HAI Model, since it does not condense the geocoded locations into clusters before modeling the network. However, this feature comes at a cost since it takes more than 10 hours to do a complete run of the BellSouth model. By comparison, ICM-FL will finish a complete run in about 11 minutes on my desktop. Additionally, like all models based on geocoded data, I am sure that BellSouth's success rate is not 100 percent, so that some device to create surrogate locations must be employed.

The Efficiencies of Fiber Facilities

Q. DOES ICM-FL FAIL TO REFLECT THE EFFICIENCIES OF FIBER FACILITIES AS DR. ANKUM CLAIMS AT PAGE 59?

A. No. Dr. Ankum bases his erroneous claim on the argument that (1) remote terminals (i.e., DLCs) should be placed closer to the customer; (2) ICM-FL's use of secondary SAIs increases the amount of copper used; and (3) that ICM-FL always assumes that some portion of the feeder is copper even if the DLC is fiber-based. As I explained earlier, Dr. Ankum's position that DLCs should be forced further into the network is at odds with his complaint that ICM-FL models DLCs that are too small and underutilized, and with his criticism of Verizon's unbundled DS-1 study. Likewise, I have already explained that ICM-FL's use of secondary SAIs *decreases* the use of copper.

It is true that ICM-FL assumes the use of copper feeder, even though all of the modeled DLCs are fiber based. The copper feeder routes modeled by ICM-FL are the facilities between the distribution plant and the DLCs, or between customers not served by DLCs and the central office. All of the feeder connecting the DLCs to the wire center is fiber. Dr. Ankum's position on this issue implies that the Commission should base rates on the costs associated with a fantasy network: in order to overcome Dr. Ankum's objection, ICM-FL would have to place a DLC at the first SAI that is modeled as one moves from the end user towards the central office. This is the only way that the copper subfeeder could be eliminated. Such a network would bear no resemblance to the network from which Verizon provisions UNEs in Florida.

DLC Placement Costs

Q. HAS DR. ANKUM CORRECTLY CHARACTERIZED VERIZON'S TESTIMONY IN MASSACHUSETTS CONCERNING THE COST OF DLC PLACEMENT WITHIN BUILDINGS?

A. No. While he has correctly copied the quote from the Massachusetts proceeding at page 60 of his rebuttal testimony, he has not provided the Commission with a complete picture of the discussion in which the statement was made. The Verizon testimony he cites was rebutting Dr. Ankum's claim that the Massachusetts study made a different assumption than Verizon's New York study, and had therefore *erred* by placing DLCs within a building:

> Third, Dr. Ankum states "In New York, VZ did not advocate this design. In fact, in New York there were many instances where the RT for large buildings was placed outside of the building."
>
> The statement is erroneous. Dedicated RTs is the design employed in NY for large buildings. This fact is clearly documented in the record of the recent New York UNE proceeding. In light of the clear record in the New York proceeding, Verizon MA does not understand the basis for Dr. Ankum's assertion that "there were many instances where RT's for large buildings were placed outside of the

building." Perhaps he has confused the use of CEVs or similar underground enclosures to house RT's in some metropolitan installations with the situation of serving a large building. Such underground structures are used in metropolitan areas as substitutes for the common above ground cabinets typically used in suburban areas. In either case, the RT is serving an extended distribution area not a single building. An RT outside in a CEV to serve a large building would only be employed in the very rare circumstance that the building owner would not supply space within the building. The reason is simple economics. An underground structure in a metropolitan environment could cost $100K or more. Space within buildings is usually less expensive.

Fourth, Dr. Ankum alleges: "It is wasteful to incur the expense of an RT with ample spare to serve other customers, but to limit the use of this RT artificially to just one set of customers."

Dr. Ankum offers no support for this assertion. The RTs placed in a building are efficiently designed and sized to the application, not with ample spare. Efficient engineering decisions should be based on the relative economics of the available alternatives. The use of a dedicated RT to serve a large building is more economic generally than the practical alternatives which are typically either copper cable or copper extension from a remote RT. The economics of fiber versus copper always favor extending the RT as close to the customer as possible as long as two conditions can be met: that a site for the RT can be obtained at reasonable cost and that the fill of the system exceeds a threshold level. Both conditions are met in the large building situation. Locating RT's within a building involves minimum site cost and the line size threshold used in the study insures that reasonable fill is achieved.

(Case Number D.T.E. 01-20, *Surrebuttal Testimony of Verizon-MA Panel* at pp 56-57.)

It is clear from the above that the comparison being made is between locating a DLC in a building and locating it in an underground, controlled environment vault (CEV). As I explain below, ICM-FL assumes that its DLCs are either pole-mounted or are placed on concrete pads. There is no evidence to suggest that placing a DLC in a building is cheaper than either of these options.

Q. DOES ICM-FL MODEL DLC PLACEMENT COSTS AS IF THEY WERE LOCATED IN BUILDING?

A. No. ICM-FL has no mechanism for deciding if a given DLC is located in a building. However, in lodging this complaint against ICM-FL, Dr. Ankum proposes a standard that no model that I am aware of in Florida has ever met. This includes BCPM, BellSouth's and Sprint's current models, as well as the HAI Model. Moreover, Dr. Ankum's complaint is one-sided at best. None of these models, including ICM-FL, models the cost of placing DLCs underground in a CEV. Use of CEVs occurs in the real network because of congestion or because of local zoning ordinances. The placement costs associated with CEVs exceed the DLC placement costs modeled by ICM-FL. Thus, Dr. Ankum would have the Commission reduce the costs modeled by ICM-FL to reflect the allegedly lower costs of placing DLCs in a building, but is content to ignore the higher costs of CEV placement.

Q. HOW DOES ICM-FL MODEL THE PLACEMENT COSTS OF DLCS?

A. For DLCs that are 448 lines and smaller, ICM-FL assumes that the DLC is pole mounted. For larger DLCs, ICM-FL assumes the DLCs are placed outside on a concrete pad -- this is the same assumption that the HAI Model makes for all of its modeled DLCs. If the DLC is placed in a building, not all of the placement costs will be eliminated, since installing the DLC in a building will require the assembly of individual racks and shelves. If the modeled placement costs for the large DLCs are reduced by eliminating the portion associated with securing an easement, and by reducing the site preparation costs by 50 percent, the TELRIC for the 2-wire loop decreases by 9 cents to $22.85 per month. So, even if Dr. Ankum's claimed cost savings do exist, the overall impact on the TELRIC is very small.

Verizon's Costs for Unbundled DS-1 Loops

Q. HOW WERE THE TELRICS FOR UNBUNDLED DS-1 LOOPS DEVELOPED?

A. Verizon's unbundled DS-1 TELRICs are based on the weighted average of provisioning such circuits over metallic and fiber facilities. The costs of provisioning DS-1s via metallic facilities are based on the 4-wire loop costs modeled by ICM-FL for each wire center, plus the cost of the circuit equipment needed to create the DS-1 circuit. The costs of provisioning DS-1s via a fiber facility are based on the cost of three fiber systems: (1) an OC3 system equipped for 28 DS-1s, (2) an OC3 system equipped for 84 DS-1s, and (3) an OC12 system equipped for 336 DS-1s. The costs of the fiber facilities for the fiber systems are based on the average loop length modeled by ICM-FL for business loops in each Florida wire center.

Referring to Dr. Ankum's exhibit AHA-10 -- which only portrays results for a single wire center -- the fill factors used for each of the four provisioning methods are shown in Column C. The fiber system and facility costs in Column A are divided by the corresponding number of DS-1s to obtain a capacity cost per DS-1 assuming 100 percent utilization. These costs are divided by the fill factor in Column C to obtain a cost per provisioned DS-1. The costs per provisioned DS-1 are averaged based on the weightings in Column E to arrive at an average cost per provisioned DS-1 for each wire center. The statewide average cost across all wire centers is

$210.83 per DS-1 per month.

Q. HOW ARE THE FILL FACTORS AND WEIGHTING DISCUSSED ABOVE DEVELOPED?

A. The 100 percent fill factor for the metallic facility is used to account for the fact that the costs already reflect ICM-FL's modeled utilization, and the 33.3 percent fill factors for the fiber facilities reflect the use of 4 fibers out of a 12-fiber sheath. The fills for the three fiber systems are based on the actual number of provisioned circuits divided by the system capacity on a statewide basis. The weightings shown in Column E are based on the actual number of circuits provisioned in the state for each facility type. The weightings represent the likelihood that a given unbundled DS-1 will be provisioned via one of the four methods described above. Note that only the metallic facility and the 28 DS-1 OC3 system have a significant effect on the costs: if the other two fiber systems are eliminated, the monthly cost in Dr. Ankum's exhibit decreases by only one-tenth of one percent.

Q. WHERE ARE THE DEVELOPMENT OF THESE COSTS FOUND IN VERIZON'S COST STUDY FILING?

A. They are found in the "FLHICapWtg.xls" and "FL Fiber Loops.xls" spreadsheets on the CD-ROM that contained Verizon's cost study filing. The latter file is used to model the fiber terminal and facility costs shown in Column A of Dr. Ankum's exhibit. The facility costs vary by wire center and are based on the average modeled loop length for business lines as explained above. The spreadsheet must be "run" for each wire center by entering the wire center number in cell K3 in the tab labeled INVRPTS. (The wire center number is simply the sequence number for each CLLI found in Column A of the tab labeled FL Nodes. It is nothing more than an integer ranging from 1 to 90.) The resulting facility cost is found in cell O47 in the MRCRPTS tab. This value is copied and pasted into the "FLHICapWtg.xls" spreadsheet in column E of the tab labeled WC DATA. Column F of this tab contains the DS-1 metallic costs extracted from ICM-FL. This spreadsheet is also "run" for each wire center by entering its sequence number in cell S6 of the REPORTS tab. The resulting cost is found in cell P47 of the same tab and is copied and pasted to column G of the WC DATA tab. The statewide average is found in cell G97 of the same tab

Q. ARE THE FILLS USED IN THE STUDY FOR THE THREE FIBER-BASED SYSTEMS REASONABLE?

A. Yes. What Dr. Ankum fails to realize is that the fills are based on provisioning DS-1's to specific locations in Verizon's actual network. In order to achieve the 90 percent fill recommended by Dr. Ankum for the smallest of the three fiber systems, the average number of DS-1s provided at each location would have to be 25.2 (28 x 0.9) -- on a voice grade basis, this is more than 600 circuits. Such an assumption is simply not representative of the average demand characteristics that Verizon has experienced in provisioning DS-1s.

Q. SHOULD THE COMMISSION ACCEPT DR. ANKUM'S RECOMMENDATION TO BASE THE COSTS OF UNBUNDLED DS-1s ON A 90 PERCENT FILL FOR THE THREE FIBER SYSTEMS?

A. No. Once again, Dr. Ankum would have the Commission base UNE costs on a network operating nearly at capacity. As I explained above, the fills used in the study represent the utilization that Verizon has actually realized in its existing network. There is no reason to expect the level of utilization to miraculously increase to 90 percent.

Q. WHAT IS THE EFFECT OF BASING COSTS, AND ULTIMATELY RATES, ON TARGET FILLS THAT EXCEED THE ACTUAL AVERAGE FILL?

A. In terms of Dr. Ankum's specific recommendation, the unbundled DS-1 TELRIC falls from $210.82 to $106.48 per month. Conceptually, basing costs and rates on a fill greater than the average fill means that total costs will not be recovered. This is illustrated by the example shown in Surrebuttal Exhibit DGT-4.

This example assumes a company that owns only three feeder routes from which it unbundles pairs. For purposes of this example, I have set aside the question of common costs so that we can assume that the rate per pair is set equal to the TELRIC. Section 1 of the exhibit sets out the assumptions concerning the number of installed and working pairs for each route, as well as the total cost per route and for the company as a whole. Section 2 illustrates the impact of setting the company-wide per-unit cost (and rate) based on a target fill of 85 percent, greater than the averaged realized fill of 68.4 percent. Section 3 shows the same calculations based on the averaged realized fill.

If the target fill is used to develop the per-unit cost and rate, the company will not recover its total costs. This is true for any target fill that it is greater than the average. It is clear from this example that costs must be based on an average fill level, not on an unrealistically high and unsupported level such as Dr. Ankum recommends.

Cost Studies for EELS

Q. IS DR. ANKUM CORRECT WHEN HE CLAIMS THAT PROVISIONING AN EEL IS DIFFERENT THAN PROVISIONING AN UNBUNDLED LOOP, MULTPLEXING AND INTEROFFICE TRANSPORT?

A. No. As a threshold matter, I note that his example at page 69 of his rebuttal testimony does not apply to the 41 percent of loops that ICM-FL models as being directly served by the main distribution frame. To the extent that his position has any merit whatsoever, it would only apply to those loops served by a DLC. Thus, Dr. Ankum's position on EELs is the same as his position on IDLCs -- it is premised on his incorrect claim that it is possible to unbundle a loop from an IDLC using the GR 303 interface. As explained above, no commercially viable means of accomplishing this task exists.

The transport facility between the two offices in Dr. Ankum's example is a path dedicated to the voice-grade circuit corresponding to the end-user involved. If the DS-1 from the DLC serving the end-user is integrated into the trunk side of the switch, the only way to dedicated this path is to "hairpin" or "nail up" the circuit through the sidedoor port of the switch. This arrangement wastes switch resources as Telcordia and MCI WorldCom have acknowledged. If an entire DS-1 is used to establish this path, then the "loop portion" of the EEL is not an unbundled loop -- it is an entirely different service. Moreover, such arrangements will result in underutilization of DS-1s, particularly as the number of ALECs increases.

The GTD-5 Is a Forward-Looking Technology

Q. IS THE GTD-5 A FORWARD-LOOKING TECHNOLOGY?

A. Yes. AGCS continues to market and support the GTD-5, and Verizon continues to buy line additions and remotes. In April, 1997, BC TEL signed a $60 million volume purchase agreement with AGCS to purchase GTD-5 Class 5 digital switching equipment and IN products. Contrary to the findings of the Texas Public Utility Commission relied upon by Dr. Ankum, ISDN is supported by the GTD-5. Finally, in May, 2000, both the Michigan Public Service Commission and the Michigan staff concluded that the GTD-5 is a forward-looking switch and should be used to estimate Verizon's switching costs. (Case No. U-11832, *Order* (May, 2000) at pp. 24 and 27). Verizon has no plans to replace the GTD-5 and will provision UNEs out of a network in Florida that contains GTD-5s in 72 out of 90 wire centers.

Switch Pricing

Q. **IS DR. ANKUM CORRECT THAT VERIZON HAS PROPOSED SWITCHING COSTS THAT ARE ONLY BASED ON THE COST OF ADDING TO EXISTING SWITCHES?**

A. No. As I explained above and in my direct testimony, the switching costs modeled by ICM-FL are based on the prices Verizon pays for initial switch placements and expansions. (Tucek Direct, p. 17). This is accomplished through use of a discount factor in the SCIS and CostMod runs that reflects the initial switch pricing, and through use of an investment adjustment factor (IAF) that reflects the pricing of additions. The files supporting the development of the discount factors were provided with Verizon's cost study, and the calculation was explained further in response to the ALEC Coalition's Interrogatory Number 23, Set 1.

Q. **PLEASE DESCRIBE HOW THE DISCOUNTS USED AS INPUTS TO SCIS AND COSTMOD WERE DEVELOPED.**

A. First, SCIS and CostMod were run with no discount for a set of eight model office clusters for the 5ESS, GTD-5 and DMS-100 switching technologies as shown in the table below:

Cluster Size	Base Unit	Remote 1	Remote 2	Remote 3
700	700	----	----	----
1,700	1,700	----	----	----
3,400	3,400	----	----	----
6,300	5,000	1,300	----	----
10,900	8,300	2,600	----	----
18,500	13,300	2,600	2,600	----
36,200	29,200	2,333	2,333	2,333
90,000	60,000	3,750	**<== 8 of these remotes**	

For the DMS-10, SCIS was run with no discount for the first five model office clusters shown above. The usage inputs for each of these SCIS and CostMod runs were based on system-wide averages for comparably sized switches. Next, discounts were computed for each of the above configurations based on the total modeled switch costs and on the switch costs resulting from the vendor quotes and the Nortel contract for initial switch purchases. Finally, weighted averages of these discounts across the cluster sizes were calculated. These weighted averages are the discount inputs used in the subsequent SCIS and CostMod runs for each Verizon Florida wire center.

Q. HOW WAS THE IAF INPUT CALCULATED?

A. ICM-FL's IAF input is calculated for each of the base unit line sizes shown above. Line and trunk growth for each base unit is calculated over a six-year timeframe, using Florida-specific growth rates, and are priced as additions to existing switches. The IAF input for each base-unit and line-size combination is calculated as the present value of the purchase cost of the initial switch plus the additions, divided by the initial switch cost. Algebraically, the factor's calculation can be expressed as:

$$\frac{\text{Initial Switch Cost} + \text{PV(Cost of Line Additions)}}{\text{Initial Switch Cost}}$$

The outputs of SCIS and CostMod, which only reflect the initial switch pricing, are multiplied by this factor to produce a blended switch cost that reflects the pricing for both initial switch purchases and for line additions. The numerator represents ICM-FL's view of the total material cost of the switch using the initial switch pricing and the cost of additions.

Q. HOW DOES THE CALCULATION OF THE IAF INPUT COMPARE TO THE CALCULATION PROPOSED BY DR. ANKUM?

A. ICM-FL's IAF input is very similar to Dr. Ankum's proposal. At page 87 of his rebuttal testimony, Dr. Ankum proposes the following formula:

$$\frac{\text{PV(cutover price x \# of cutover lines) + PV(growth price x \# growth lines)}}{\text{Sum of Cutover and Growth Lines}}$$

The formula offered by Dr. Ankum produces a cost per line that, if multiplied by the sum of the cutover and growth lines, produces Dr. Ankum's view of total switch costs. In other words, the numerator of his formula represents the total material cost of the switch using cutover and growth pricing. Because Dr. Ankum's "cutover price" and "growth price" are just different terms for "initial switch pricing" and the "cost of additions", the numerators of both formulas are conceptually equivalent: they represent ICM-FL's and Dr. Ankum's view of what a switch costs based on a mix of cutover and growth pricing. As explained below, ICM-FL's IAF input produces a lower estimate of switching costs than does Dr. Ankum's formula.

Q. WHY DOES ICM-FL'S IAF INPUT PRODUCE A LOWER RESULT THAN DR. ANKUM'S FORMULA?

A. There are two reasons. First, it is clear that the first term of each numerator is identical -- the present value of "the cutover price x the number of cutover lines" is nothing more than the initial switch price. The expressions differ in the second term, since Dr. Ankum proposes calculating the present value of the additions over the entire life of the switch. As explained above, the IAF input only reflects additions over a six-year timeframe. If the analysis were extended over the entire life of the switch (18 years in Dr. Ankum's view, but only 10 years according to Verizon witness Allen Sovereign), the factor would necessarily be higher as would the switching costs modeled by ICM-FL.

Second, the cost of the additions used in the development of the IAF input does not include *all* of the additional vendor equipment that would be needed over the life of the switch. The development of the IAF input excludes such items as additional host/remote links, software and processor upgrades, or additional network paths. Including these items over the life of the switch would again result in a higher IAF input and higher modeled switching costs.

Q. ON A PER-LINE BASIS, DOES ICM-FL MODEL HIGHER SWITCH COSTS FOR THE GTD-5 THAN IT DOES FOR THE 5ESS AND NORTEL SWITCHES?

A. The answer to this question is confidential, and is contained in confidential Surrebuttal Exhibit DGT-5.

Feature Costs

Q. IS DR. ANKUM CORRECT THAT MOST OF THE COSTS OF FEATURES ARE NON-TRAFFIC SENSITIVE?

A. No. Feature costs arise from three sources: (1) the right-to-use fees for specific feature packages; (2) special hardware, such as conference circuits, that some features require; and (3) the processor time utilized by feature activation. Additionally, it is physically impossible for every port to have access to every switch feature. For example, only a port that corresponds to a Centrex customer can access Centrex features, and only ISDN lines can access ISDN features. Consequently, Verizon's feature costs will depend both on the number and types of features that end-users subscribe too. If access to all features is sold to ALECs on a flat-rate basis, then from their perspective the features have been priced at zero on the margin. It is reasonable to assume that ALECs purchasing such ports will offer the features at low or zero cost to end users in order to differentiate their services. The success of the ALECs' marketing efforts will consequently determine the actual demand on the switch processor resulting from feature usage -- if it increases enough, it may well be that a larger processor must be installed or that multiple switches will have to be placed. To claim that feature costs are mostly non-traffic sensitive ignores the costs arising from specialized hardware and from processor usage, as well as the impact of ALEC pricing to their own end users, on the demand placed on Verizon's switch resources.

Q. DO THE PORT AND MOU COSTS ESTIMATED BY ICM-FL INCLUDE THE COSTS OF FEATURES?

A. No. If the Commission orders that these costs be recovered in the port or per-MOU rates, or in some combination of the two, it will be necessary to modify the inputs to ICM-FL to include these costs in the port and MOU TELRICs.

MR. FISCHER'S REBUTTAL TESTIMONY

Q. WHAT PORTIONS OF MR. FISCHER'S REBUTTAL TESTIMONY DOES YOUR SURREBUTTAL ADDRESS?

A. This portion of my surrebuttal addresses Mr. Fischer's recommendations concerning ICM-FL's modeling of operating expenses, including his concerns with Verizon's use of the C. A. Turner indices and with ICM-FL's calibration option. I also respond to his assertion that Verizon's common cost allocator should be within a few percentage points of BellSouth's allocator.

Q. IS MR. FISCHER CORRECT THAT THE OPERATING EXPENSES IN THE NUMERATOR OF ICM-FL'S EXPENSE-TO-INVESTMENT RATIOS ARE NOT FORWARD LOOKING?

A. No. The expenses have been made forward-looking through the adjustments that Mr. Fischer listed in his rebuttal testimony: the normalization entries for certain non-recurring items, removal of expenses related to non-forward-looking technology, removal of avoided retail costs and removal of costs that are identified and modeled through other cost studies. (Fischer Rebuttal, p. 18). Additionally, as I discussed above, the modeled expenses have been made forward-looking through a downward adjustment to reflect yet-to-be-realized merger savings. Finally, as I explain below, the numerators of the expense-to-investment ratios have also been made forward-looking through the use of the C. A. Turner indices to express the cost of the general support assets (the 21xx plant accounts) on a reproduction cost basis.

Mr. Fischer's allegation that ICM-FL does not model forward-looking operating expenses centers on his disagreement with Verizon's use of the

C. A. Turner indices, and on his claim that operating expenses should be determined through a bottoms-up determination of operating expenses. With respect to the latter claim, Mr. Fischer is espousing a standard that AT&T and MCI WorldCom have failed to embrace in Florida and elsewhere. Both of these companies have sponsored the HAI Model in numerous proceedings. This model, though flawed in many respects, adopted a similar "tops-down" approach to modeling operating expenses. Indeed, every model that I am aware of, including those filed before this Commission, has employed a similar approach.

Q. IS VERIZON'S USE OF 2000 ARMIS DATA AS THE STARTING POINT FOR MODELING OPERATING EXPENSES APPROPRIATE?

A. Yes. As I explained above in my discussion of Dr. Ankum's rebuttal testimony, if the objective is to estimate the forward-looking costs that Verizon will incur in unbundling its network, then the modeled network must have some basis in reality. The same is true for operating expenses. The 2000 ARMIS data used as a starting point were generated by the activities and resources needed to operate and maintain the network from which Verizon's UNEs are provisioned. There is no better starting point from which to model Verizon's operating expenses.

Q. WHY DOES VERIZON BASE THE CARRYING COSTS OF THE GENERAL SUPPORT ASSETS (THE 21XX ACCOUNTS) ON THE REPRODUCTION COST OF THESE ASSETS?

A. Unlike the number of poles or the amount of cable in the network, there is no direct way to model the quantity of these assets needed to support the network. It would be inappropriate to model the level of assets required on the basis of their historical cost. For example, account 2124 (General Purpose Computers) has a historical cost of $91.3 million. The reproduction cost of these assets, based on application of the C. A. Turner indices by vintage year, is $52.7 million. Likewise, account 2121 (Buildings) has a historical cost of $229.0 million and a reproduction cost of $397.3 million. Clearly, the reproduction cost is closer to the forward-looking cost of completely new assets than is the historical cost. Given that it is not possible to model the required physical quantity of such assets in the same way that one models the number of poles, etc., use of the reproduction cost is the best possible approach to modeling the costs associated with these assets.

Q. WHAT IS THE PURPOSE OF ICM-FL'S "CALIBRATION" OPTION?

A. When the user selects the calibration option, ICM-FL adjusts the denominators of the expense-to-investment ratios so that they match the modeled investment for three broad categories of plant: switching, circuit equipment, and outside plant. The calibration option ensures that the investments in the expense-to-investment ratios are consistent with the modeled investments to which they will be applied. Even with this adjustment, the total amount of expenses modeled by ICM-FL falls short of the sum of the expenses in the ratios' numerators by $11.8 million. If the option is not used, then the shortfall increases to $79.1 million.

Q. IS IT POSSIBLE TO "TURN OFF" THE C. A. TURNER AND CALIBRATION ADJUSTMENTS IN ICM-FL AS MR. FISCHER RECOMMENDS AT PAGES 20 AND 22 OF HIS REBUTTAL TESTIMONY?

A. Yes. The option to select or not select the calibration adjustment is made via ICM-FL's run-time options screen for expenses. The C. A. Turner adjustment can easily be "turned off" by modifying the inputs found in the FLGTEEXP.db table. Specifically, the "Adjust 1" value needs to be set equal to one for each of the 2xxx accounts.

Q. WHAT IS THE RESULT OF THESE CHANGES?

A. The TELRIC for the two-wire loop decreases by 71 cents to $22.23 per month. Additionally, the total direct costs modeled by ICM-FL decrease by $18.2 million, total common costs decrease by $2.5 million, and the shortfall between modeled expenses and the sum of the numerators in the expense-to-investment ratios equals $59.9 million. Recognizing these changes, including an adjustment for the $59.9 million shortfall, results in an increase in the fixed allocator from 14.09 to 19.89 percent. Surrebuttal Exhibit DGT-6 summarizes the calculation of the shortfall in modeled expenses, the change in direct and common costs, and the impact on the fixed allocator. The net impact on the average 2-wire loop UNE rate is an increase of 48 cents, to $26.65 per month.

Q. IS MR. FISCHER'S ASSERTION THAT THE COMMON COST ALLOCATORS FOR VERIZON AND BELLSOUTH BE WITHIN A FEW

PERCENTAGE POINTS OF EACH OTHER WARRANTED?

A. No. Mr. Fischer makes this assertion at page 25 of his rebuttal testimony and supports it only with an appeal to "any measure of reasonableness." Mr. Fischer's assertion rests on the incorrect assumption that Verizon and BellSouth have modeled expenses and common costs in the same way. A review of BellSouth's testimony and cost study shows that the two companies have not adopted the same approach. For example, costs that BellSouth identifies as shared are modeled with specific "shared cost factors" -- ICM-FL has no separate set of factors for shared costs, but relies instead on the assignment of costs to cost pools based on accounting detail at the work center and six-digit account level. More important, large categories of costs that are identified as common by Verizon are treated differently by BellSouth. For example, more than 35 percent of the carrying costs of the general support assets are treated as common by Verizon -- these costs make up nearly 30 percent of Verizon's total common costs. BellSouth does not assign any of these costs to the common category. Presumably, they are either directly assigned to the UNEs or attributed via BellSouth's shared cost factors. The different treatment of these costs by the two studies serves to increase Verizon's fixed allocator in two ways. First, the treatment of these costs increases the allocator by making the numerator larger in the ratio of common to direct costs. Second, the allocator is increased because these costs are excluded from the ratio's denominator.

Q. DO THE DIFFERENCES BETWEEN THE TWO COMPANIES' COST STUDIES MEAN THAT ONE IS SUPERIOR TO THE OTHER?

A. No. What it does mean is that Mr. Fischer's casual assertion that Verizon's and BellSouth's common cost allocators should be within a few percentage points of each other is unwarranted and should be disregarded by the Commission. Because the two companies adopted different methodologies with respect to identifying common costs, it is clear that nothing can be learned from comparing the resulting common cost allocators.

SUMMARY

Q. PLEASE SUMMARIZE YOUR SURREBUTAL TESTIMONY AS IT RELATES TO DR. ANKUM'S TESTIMONY OVERALL.

A. Dr. Ankum's testimony and recommendations start from the false premise that TELRIC estimates must be based on a hypothetical fantasy network. In adopting this view, Dr. Ankum shows that he is not concerned with the characteristics of the real network or with the costs that Verizon will incur in provisioning UNEs. This is contrary to the Commission's view (in 980696-TP) that "there needs to remain a basis in reality if the costs developed for the network are to have any relevance to the cost of basic local telephone service." Contrary to Dr. Ankum's testimony, ICM-FL does not produce unreasonably high UNE rates. In fact, modeled sheath feet and investment are substantially below the actual sheath feet and the reproduction cost of Verizon's existing Florida network. As I explained above and in my direct testimony, ICM-FL assumes economies of scope and scale that will never be realized and consequently produces cost estimates that must be viewed as a lower bound on the forward-looking incremental costs of provisioning UNEs to new entrants.

Dr. Ankum's rebuttal testimony also contains several unsupported statements and inconsistencies. For example, Dr. Ankum's recommendation for conduit fill simply appears in his exhibit AHA-6, and he makes the unsupported claim that the drop is a very expensive portion of the loop in ICM-FL. Additionally, Dr. Ankum recommends a 6:1 concentration ratio and also complains about the fiber-system fill factors underlying Verizon's unbundled DS-1 study. At the same time, he advocates the position that remote terminals should be pushed further into the network -- something that will lower both the average concentration ratio and the realized fills on fiber systems. Likewise, Dr. Ankum recommends that switch costs be modeled as if Verizon replaced the GTD-5 in 72 out of 90 wire centers in Florida. At the same time, he insists that switch costs be heavily weighted towards initial switch prices, and that the FCC's longer depreciation lives be used for digital switches. These positions are inconsistent since, if all of the GTD-5 switches were replaced, it is likely that the modeled prices for initial switches could not be obtained from Verizon's other switch vendors. Moreover, even if an efficient and rational carrier would replace all of its existing switches with the most current technology, the required depreciation life for digital switches would be much shorter than the 10 years sponsored by Mr.

Sovereign in his direct testimony.

Q. PLEASE SUMMARIZE YOUR SURREBUTAL TESTIMONY AS IT RELATES TO DR. ANKUM'S SPECIFIC CLAIMS AND RECOMMENDATIONS.

A. Dr. Ankum's claim that Verizon's cost study should reflect the post-merger environment is deficient in several respects. First, Dr. Ankum fails to realize that all of the anticipated merger savings were not realized on day one of the merger, and were not expected to be fully realized until three years after the close of the merger transaction. Second, he fails to recognize that the number of customers and wire centers served by Verizon in Florida have not changed as a result of the merger. Likewise, there has been no change in the local markets in which Verizon Florida purchases labor. In short, there have been no increased economies of scope and scale with respect to these aspects of Verizon's Florida network. Finally, Dr. Ankum completely overlooks the fact that Verizon's cost study contains a downward adjustment in operating expenses to reflect the anticipated merger savings. Because of these deficiencies in Dr. Ankum's testimony, the Commission should ignore his recommendations on this topic.

Dr. Ankum also wrongly claims that ICM-FL is not open and auditable. He acknowledges that he has access to the model's code, but claims that the model is not sufficiently flexible to allow model auditing and inputting of different assumptions. This is simply not true -- nearly every input to

ICM-FL, including the DLC locations, is user-adjustable. Additionally, Dr. Ankum's complaint that ICM-FL is not spreadsheet-based is belied by AT&T's and MCI's own actions. Not only have they not levied this complaint against BellSouth's model in this proceeding, they have relied on the FCC's Synthesis Model to advocate their positions in other states. Specifically, AT&T and MCI are currently sponsoring a modified version of the Synthesis Model in UNE proceedings in Virginia, Maryland, and Pennsylvania. In doing so, they have modified the loop portion of the Synthesis Model, which has a code-based platform utilizing Turbo Pascal. Clearly, even though Dr. Ankum may not have the expertise or ability to modify ICM-FL's code, other employees and consultants employed by AT&T and MCI can.

Dr. Ankum has made numerous recommendations concerning fill factors and has claimed that TELRIC estimates should not reflect the cost of capacity needed to serve future demand. In making his fill factor recommendations, Dr. Ankum would have the Commission set rates based on the cost of a network that is severed from reality and operating at near capacity. Additionally, his recommended fill for distribution plant is higher than the fill produced by the HAI Model that has been sponsored by AT&T and MCI in many states, including Florida. Moreover, Dr. Ankum's position concerning the cost of capacity for future growth is at odds with the position of AT&T witnesses in Massachusetts, and ignores the fact that today's customers benefit from the provision of spare capacity. More to the point, it begs the question of how these costs should be recovered if they are excluded from the rates established in this proceeding. The answer is that they will not be recovered unless rates are based on the point in time that a subscriber or an ALEC connects to the network. Dr. Ankum's fill factor recommendations and his testimony concerning capacity for future demand should be disregarded by the Commission.

Dr. Ankum has claimed that the costs of an unbundled loop should be based on an IDLC using the GR 303 interface instead of the UDLC configuration assumed by ICM-FL. In making this claim, he has ignored the fact that no switch or NGDLC vendors have commercially offered products with the functionality required to support a multi-carrier operation of a GR-303 interface. Except for the so-called "hairpinning" solution, all of the hypothetical means of unbundling a loop from an IDLC require that one or more DS-1s be dedicated to each ALEC from each DLC from which they unbundle loops. Not only does this increase the number of DS-1 links required, such an arrangement constitutes a different service than an unbundled loop. Both Telcordia and MCI WorldCom have acknowledged that "hairpinning" is wasteful of the ILEC switching resources. The TELRIC of unbundled loops should be based on the UDLC configuration assumed in Verizon's cost study filing.

The Commission should disregard Dr. Ankum's recommendation that a 6:1 concentration ratio be assumed when developing DLC costs. For one thing, the fabricated example underlying Dr. Ankum's argument wrongly assumes that total DLC costs will remain constant even though the number of lines served increases. Moreover, increasing the concentration ratio to 6:1 only impacts the costs of the DSX-1 panel and associated cards in ICM-FL's IDLC inputs. Compared to the 4:1 concentration ratio assumed by ICM-FL, the 2-wire loop TELRIC decreases by only one cent, assuming that IDLCs are used.

Dr. Ankum's drop length recommendations are supported only by the statement that his recommended lengths "reflect that drops tend to be shorter in densely populated urban areas, where one might find more apartment complexes and town houses, than in suburban and rural areas." This statement, while true, says nothing about the specific lengths Dr. Ankum proposes the Commission adopt. Moreover, reducing ICM-FL's input for the maximum average drop length to 165 feet produces average drop lengths close to Dr. Ankum's proposal and only reduces the average 2-wire TELRIC by a dime. The Commission should ignore Dr. Ankum's drop-length recommendation because it is unsupported and because the impact on the estimated costs is not significant.

Dr. Ankum's criticism of ICM-FL's modeling of customer locations is based on his incorrect assertion that ICM-FL assumes that "customers are equally distributed throughout a fixed arbitrary grid," and that this "results in excessive amounts of plant being modeled and plant being placed to locations where no customers exist." As I explained above, this is simply not true. Further, the HAI benchmark that Dr. Ankum points to in support of geocoding is itself seriously flawed. In addition to being expensive to implement, geocoding is not the panacea Dr. Ankum purports it to be because failure to locate 100 percent of the customers inevitably requires the use of surrogate locations. Finally, unless the geocoded information is discarded before the modeled network is designed, geocoding will substantially increase the time associated with a model run. ICM-FL models customer locations correctly and Dr. Ankum's testimony to the contrary should be disregarded by the Commission.

Dr. Ankum's claim that ICM-FL does not take advantage of the efficiencies of fiber facilities should be disregarded by the Commission because it is not true. ICM-FL assumes that all DLCs are connected to the central office via fiber feeder routes. The only copper feeder modeled by ICM-FL is the subfeeder needed to connect distribution plant to the DLCs or, in the case of customers not served by DLCs, to the switch. Further, ICM-FL efficiently uses fiber because all of the modeled fiber routes -- including the interoffice fiber routes -- share the same sheath to the fullest extent possible. Finally, Dr. Ankum's complaint should be ignored because his objection could only be overcome by placing a DLC at the first SAI modeled as one moves from the end user towards the office. While this would eliminate all copper feeder in ICM-FL, the resulting network would bear no resemblance to the network from which Verizon provisions UNEs.

Dr. Ankum's complaint that ICM-FL does not model the placing of DLCs within buildings should be ignored because it is based on a mischaracterization of Verizon's Massachusetts testimony, and because it fails to consider that the higher cost of CEV placements is not modeled, even though CEVs occur in the real network. Further, Dr. Ankum is espousing a standard not met by any model that has been filed in Florida, including models sponsored by AT&T.

Dr. Ankum's criticism of Verizon's undbundled DS-1 study centers on his disagreement with the fill factors used in developing the costs of the fiber-based systems. His recommendation that a 90 percent fill implies that the average site served by the smallest modeled fiber system would require more than 25 DS-1 circuits, or 600 voice-grade equivalents. Basing costs, and rates, on a fill that exceeds the actual realized fills upon which Verizon's cost study is based means that total costs will not be recovered. Accordingly, Dr. Ankum's unsupported recommendation should be rejected.

Dr. Ankum's position on EELs has no merit whatsoever with respect to the 41 percent of loops that ICM-FL models as being directly served by the main distribution frame. With respect to the remaining loops, his argument relies on the ability to unbundle loops from an IDLC, and should therefore be rejected for that reason alone. Moreover, all of the hypothetical arrangements for delivering loops to ALECs from an IDLC either waste Verizon's switching resources or result in underutilization of

DS-1 circuits.

Contrary to Dr. Ankum's claim, the GTD-5 is a forward-looking switch and is marketed and supported by its manufacturer, AGCS, Inc. Even if it was appropriate to model switching costs as if all of the GTD-5s were replaced -- something that Verizon has no intention of doing -- the switch prices and other costs used by ICM-FL to estimate switching costs could not be attained. Dr. Ankum's recommendation to replace the GTD-5 has no basis in reality and should be rejected.

Dr. Ankum is simply wrong when he claims that Verizon bases its switching costs solely on the pricing for switch additions. To the contrary, ICM-FL's development of switch costs is consistent with Dr. Ankum's own proposed method and results in a lower level of modeled switch costs. Accordingly, Dr. Ankum's testimony on this issue should be ignored.

Finally, Dr. Ankum is wrong to suggest that feature costs are mostly non-traffic sensitive. Feature costs arise out of right-to-use fees, specialized hardware, and processor usage, and will in part be determined by the ALECs' marketing of features to end users. If feature costs are to be recovered either through the port or MOU rates, then ICM-FL will have to be modified to include the feature costs in the corresponding TELRICs.

Q. PLEASE SUMMARIZE YOUR SURREBUTTAL TESTIMONY AS IT RELATES TO MR. FISCHER'S REBUTTAL TESTIMONY.

A. Mr. Fischer is incorrect when he claims that ICM-FL's expenses are not forward-looking. ICM-FL's expenses have been made forward-looking through the normalization entries for certain non-recurring items; the removal of expenses related to non-forward-looking technology; the removal of avoided retail costs; the removal of costs which are identified and modeled through other cost studies; and through a downward adjustment to reflect yet-to-be-realized merger savings. The modeled expenses have also been made forward-looking by basing the carrying cost of the general support assets on their reproduction cost through use of the C. A. Turner indices.

Mr. Fischer's objection to ICM-FL's "calibration" adjustment is unfounded. The calibration adjustment is used to ensure that the investments in the expense-to-investment ratios are consistent with the modeled investments to which they will be applied.

Mr. Fischer's recommendations concerning the C. A. Turner indices and the calibration adjustment should be rejected by the Commission. However, if they are accepted, the common cost allocator will need to be recalculated to reflect the change in common and direct costs, and to correct for the $59.9 million calibration shortfall. As a result, the allocator will increase from 14.09 to 19.89 percent.

Finally, the Commission should disregard Mr. Fischer's assertion that Verizon's and BellSouth's common cost allocator should be within a few percentage points of each other. Because of differences in the underlying identification of common costs, nothing can be learned by comparing the resulting allocators for the two companies.

Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?

A. Yes.

Verizon - Florida

Docket No. 990649B-TP
Dave G. Tucek Exhibit No. _______
Surrebuttal Exhibit DGT-1

Comparison of ICM-FL Modeled Investment with Reproduction Cost

				****** All Accounts ******		****** Network Accts ******	
Acct No.	Account	Composite C. A. Turner Index*	2000 ARMIS Amount (13-month Average)	2000 Reproduction Cost	ICM Modeled Investment**	2000 Reproduction Cost	ICM Modeled Investment**
211100	Land***	1.0000000	19,679,476	19,679,476	19,679,476		
211200	Motor Vehicles	1.1151000	25,431,019	28,358,129	28,358,129		
211500	Garage Work Equipment	1.1341000	1,198,047	1,358,705	1,358,705		
211600	Other Work Equipment	1.1341000	29,577,948	33,544,351	33,544,351		
212100	Buildings	1.7387000	229,016,159	398,190,396	398,190,396		
212200	Furniture	1.1062000	6,190,428	6,847,851	6,847,851		
212300	Office Equipment	1.0152062	70,101,686	71,167,666	71,167,666		
212400	General Purpose Computers	0.5772000	91,278,237	52,685,798	52,685,798		
221200	Digital Electronic Switching	0.7506000	993,018,000	745,359,311	432,871,846	745,359,311	432,871,846
223100	Radio Systems	1.0319000	1,838,000	1,896,632	0	1,896,632	0
223200	Circuit Equipment	0.9647000	880,659,000	849,571,737	496,618,041	849,571,737	496,618,041
241100	Poles	2.1156000	29,177,755	61,728,458	22,695,697	61,728,458	22,695,697
242110	Metallic Aerial Cable	1.4214000	220,780,478	313,817,371	216,821,324	313,817,371	216,821,324
242120	Nonmetallic Aerial Cable	1.0245000	1,052,707	1,078,498	1,982,472	1,078,498	1,982,472
242210	Underground Cable - Metallic Cable	1.4625000	349,586,655	511,270,483	312,102,793	511,270,483	312,102,793
242220	Underground Cable- Nonmetallic Cable	1.0587000	100,203,115	106,085,038	10,750,259	106,085,038	10,750,259
242310	Buried Cable - Metallic	1.2945000	1,351,609,461	1,749,658,447	981,811,200	1,749,658,447	981,811,200
242320	Buried Cable - Nonmetallic	1.0157000	9,999,634	10,156,628	33,801,722	10,156,628	33,801,722
242410	Submarine Cable - Metallic	2.0746000	1,731,402	3,591,967	0	3,591,967	0
242420	Submarine Cable - Nonmetallic	1.1769000	1,012,906	1,192,089		1,192,089	
242610	Intra-building Network Cable - Metallic	1.5998000	1,894,273	3,030,458	0	3,030,458	0
243100	Aerial Wire	1.0628000	1,277,751	1,357,994	0	1,357,994	0
244100	Conduit Systems	1.8036000	301,191,862	543,229,642	476,435,131	543,229,642	476,435,131
269030	Intangibles - NW Software -Appl. & Oprtng****	1.0000000	40,212,501	70,490,076	70,490,076	70,490,076	70,490,076
			4,757,718,500	5,585,347,203	3,668,212,934	4,973,514,831	3,056,380,561
	Variance as a Percent of Reproduction Cost:			-34.3%		-38.5%	

Notes:

* From Attachment J.1, Section 7.PDF .

** From the Calibration Report from the ICM-FL Reports menu. Amounts for Non-network accounts equal the reprodcution costs.

***Reproduction amount set equal to book value for Land.

****Reproduction amounts set equal to ICM-FL modeled investment to reflect consistent treatment across all wire centers.

Verizon - Florida

Docket No. 990649B-TP
Dave G. Tucek Exhibit No. ________
Surrebuttal Exhibit DGT-2

Impact of Market Segmentation on DS-1 Requirements

		UDLC Configuration		****************** IDLC Configuration Required DS-1 Links For Each DLC ******************			
				Market Share *** Scenario 1 ***		Market Share *** Scenario 2 ***	
DLC Size	Number of Modeled DLCs	6:1 DS-1 Links	4:1 DS-1 Links	6:1	4:1	6:1	4:1
24	8	1	1	3	3	3	3
48	9	1	1	3	3	3	3
96	17	1	1	3	3	3	3
192	39	2	2	3	3	3	4
224	12	2	3	3	3	3	4
448	110	4	5	6	6	4	6
672	55	5	7	6	9	6	9
896	61	7	10	9	12	7	11
1120	53	8	12	9	12	9	12
1344	51	10	14	12	15	11	16
1568	38	11	17	12	18	12	18
2016	596	14	21	15	21	16	23

	UDLC		*** Scenario 1 ***		*** Scenario 2 ***	
	6:1	4:1	6:1	4:1	6:1	4:1
Total Modeled DS-1s:	10,974	16,205	12,279	16,743	12,482	17,976
	Percent Change:		11.9%	3.3%	13.7%	10.9%

Impact of Market Segmentation on DS-1 Requirements

IDLC Configuration
Market Share
Scenario 1

	Carrier Number 1			Carrier Number 2			Carrier Number 3		
DLC Size	Share 33.33% Customers	6:1 DS-1 Links	4:1 DS-1 Links	Share 33.33% Customers	6:1 DS-1 Links	4:1 DS-1 Links	Share 33.33% Customers	6:1 DS-1 Links	4:1 DS-1 Links
24	8	1	1	8	1	1	8	1	1
48	16	1	1	16	1	1	16	1	1
96	32	1	1	32	1	1	32	1	1
192	64	1	1	64	1	1	64	1	1
224	75	1	1	75	1	1	74	1	1
448	149	2	2	149	2	2	150	2	2
672	224	2	3	224	2	3	224	2	3
896	299	3	4	299	3	4	298	3	4
1120	373	3	4	373	3	4	374	3	4
1344	448	4	5	448	4	5	448	4	5
1568	523	4	6	523	4	6	522	4	6
2016	672	5	7	672	5	7	672	5	7

Impact of Market Segmentation on DS-1 Requirements

IDLC Configuration
Market Share
Scenario 2

*************** ****************************** *************** ******************************

	Carrier Number 1			Carrier Number 2			Carrier Number 3		
DLC Size	Share 60.00% Customers	6:1 DS-1 Links	4:1 DS-1 Links	Share 25.00% Customers	6:1 DS-1 Links	4:1 DS-1 Links	Share 15.00% Customers	6:1 DS-1 Links	4:1 DS-1 Links
24	14	1	1	6	1	1	4	1	1
48	29	1	1	12	1	1	7	1	1
96	58	1	1	24	1	1	14	1	1
192	115	1	2	48	1	1	29	1	1
224	134	1	2	56	1	1	34	1	1
448	269	2	3	112	1	2	67	1	1
672	403	3	5	168	2	2	101	1	2
896	538	4	6	224	2	3	134	1	2
1120	672	5	7	280	2	3	168	2	2
1344	806	6	9	336	3	4	202	2	3
1568	941	7	10	392	3	5	235	2	3
2016	1210	9	13	504	4	6	302	3	4

Verizon - Florida

Docket No. 990649B-TP
Dave G. Tucek Exhibit No. ________
Surrebuttal Exhibit DGT-3

Difference Between a 4:1 and a 6:1 Concentration Ratio

		Concentration Ratio			4 : 1
		1 : 1	4 : 1	6 : 1	Minus
DLC Size	**Size / 24**	**DS-1 Links**	**DS-1 Links**	**DS-1 Links**	**6 : 1**
24	1.0000	1	1	1	0
48	2.0000	2	1	1	0
96	4.0000	4	1	1	0
192	8.0000	8	2	2	0
224	9.3333	10	3	2	1
448	18.6667	19	5	4	1
672	28.0000	28	7	5	2
896	37.3333	38	10	7	3
1120	46.6667	47	12	8	4
1344	56.0000	56	14	10	4
1568	65.3333	66	17	11	6
2016	84.0000	84	21	14	7

Formula for Size = 896

896 37.3333 38 10 7 3

37.3333 → =896/24

38 → =ROUNDUP(37.3333,0)

10 → =ROUNDUP((896/24)/4,0)

7 → =ROUNDUP((896/24)/6,0)

3 → =10 - 7

Impact of High Target Fill Factors

Hypothetical Example of Company with Three Feeder Routes

Assumed Target Fill: **85.0%**

Section 1	**Route 1**	**Route 2**	**Route 3**	**Total Company**
Number of Installed Loops	500	700	1,000	2,200
Number of Active Loops	255	400	850	1,505
Actual Fill	51.0%	57.1%	85.0%	68.4%
TELRIC per Route	$7,500	$10,500	$15,000	$33,000

Calculation of TELRIC on a per Loop Basis
(Sum of TELRIC per Route) / (Sum of Installed x Fill Factor)

Section 2				
Using Target Fill				
TELRIC per Loop	$17.65	$17.65	$17.65	$17.65
times Number of Active Loops	255	400	850	1,505
Implied TELRIC per Route ==>	$4,500	$7,059	$15,000	$26,559
Shortfall	($3,000)	($3,441)	$0	($6,441)
Section 3				
Using Actual Fill				
TELRIC per Loop	$21.93	$21.93	$21.93	$21.93
times Number of Active Loops	255	400	850	1,505
Implied TELRIC per Route ==>	$5,591	$8,771	$18,638	$33,000
Shortfall	($1,909)	($1,729)	$3,638	$0

Comparison of Modeled Investment per Line

Q. ON A PER-LINE BASIS, DOES ICM-FL MODEL HIGHER SWITCH COSTS FOR THE GTD-5 THAN IT DOES FOR THE 5ESS AND NORTEL SWITCHES?

A. XXX This is shown in the table below. Whether the modeled switch costs include or exclude power, test equipment, and the EF&I and IAF adjustments, the modeled switch investment per line for the XXXXXXXXXX is less than the modeled investment for the XXXXX and the XXXXXX.

Note that both the modeled investments shown below and the relative ordering of the three vendors are company and vendor confidential.

	Without Power, Test, EF&I and IAF Adjustments	With Power, Test, EF&I and IAF Adjustments
XXXXXXX	$XXXXXX	$XXXXXX
XXXXXXX	$XXXXXX	$XXXXXX
XXXXXXX	$XXXXXX	$XXXXXX
XXXXXXX	$XXXXXX	$XXXXXX
XXXXXXX	$XXXXXX	$XXXXXX

Impact of C. A. Turner and Calibration on Fixed Allocator

FILED FIXED ALLOCATOR CALCULATION

(Attachment DBT-1, Trimble Direct)

$$\text{Fixed Allocator} = \frac{\text{Common Costs}}{\text{Direct Costs}} = \frac{\$169,821,794}{\$1,205,040,469} = 14.09\%$$

FIXED ALLOCATOR WITH ADJUSTMENT FOR CALIBRATION SHORTFALL OF ($11,752,844)

(Based on Filed Costs -- See Page 2)

$$\frac{\text{Adjusted Common Costs}}{\text{Adjusted Direct Costs}} \quad \frac{\$181,574,638}{\$1,193,287,625} = 15.22\%$$

FIXED ALLOCATOR WITH ADJUSTMENT FOR CALIBRATION SHORTFALL OF ($79,108,406)

(With No Calibration -- See Page 2)

$$\frac{\text{Adjusted Common Costs}}{\text{Adjusted Direct Costs}} \quad \frac{\$248,930,200}{\$1,125,932,062} = 22.11\%$$

FIXED ALLOCATOR WITH ADJUSTMENT FOR

CALIBRATION SHORTFALL OF ($59,940,281)
CHANGE IN DIRECT COSTS OF ($18,164,124)
CHANGE IN COMMON COSTS OF ($2,465,947)

(With No Calibration and No C. A. Turner Adjustment– See Page 2)

$$\frac{\$227,296,128}{\$1,142,634,241} = 19.89\%$$

Note: The calibration shortfall increases the numerator and decreases the denominator of the allocator.
The change in direct costs decreases the denominator of the allocator.
The change in common costs decreases the numerator of the allocator.

Impact of C. A. Turner and Calibration on Fixed Allocator

Calculation of Calibration Shortfall and Change in Direct and Common Costs

Account	Cost Pool	Modeled Investment	************ Filed: Numerator (Expenses)	Filed: Denominator (Investment)	Filed: E / I Ratio ************	************ With No Calibration: Numerator (Expenses)	With No Calibration: Denominator (Investment)	With No Calibration: E / I Ratio ************	******* With No Calibration and No C. A. Turner Adjustment: Numerator (Expenses)	With No Calibration and No C. A. Turner Adjustment: Denominator (Investment)	With No Calibration and No C. A. Turner Adjustment: E / I Ratio *******
242120	Aerial Non-Metallic	1,982,472	12,950	671,084	0.019297	12,950	1,078,498	0.012007	12,869	1,052,707	0.012225
242110	Aerial Metallic	216,821,324	13,158,664	197,155,077	0.066743	13,158,664	316,847,831	0.041530	13,076,129	222,674,752	0.058723
242320	Buried Non-Metallic	33,801,722	221,221	7,061,615	0.031327	221,221	11,348,718	0.019493	219,834	11,012,540	0.019962
242310	Buried Metallic	981,811,200	57,327,496	1,090,940,784	0.052549	57,327,496	1,753,250,413	0.032698	56,967,919	1,353,340,863	0.042094
242220	Underground Non-Metallic	10,750,259	460,934	66,010,248	0.006983	460,934	106,085,038	0.004345	458,043	100,203,115	0.004571
242210	Underground Metallic	312,102,793	2,295,337	318,132,434	0.007215	2,295,337	511,270,483	0.004489	2,280,940	349,586,655	0.006525
241100	Poles	22,695,697	18,997,772	38,409,854	0.494607	18,997,772	61,728,458	0.307764	19,493,745	29,177,755	0.668103
244100	Conduit	476,435,131	269,448	338,018,669	0.000797	269,448	543,229,642	0.000496	277,677	301,191,862	0.000922
223200	Transmission	496,618,041	26,922,294	498,514,265	0.054005	26,922,294	846,771,815	0.031794	20,421,714	882,497,000	0.023141
221200 & 269030	Switch	503,361,922	71,515,355	503,362,208	0.142075	71,515,355	785,571,812	0.091036	59,808,480	1,033,230,501	0.057885
		3,056,380,561	191,181,472	3,058,276,238		191,181,472	4,937,182,708		173,017,348	4,283,967,750	
	Sum of Modeled Investment x E / I Ratio		179,428,628			112,073,065			113,077,067		
	Calibration Shortfall		(11,752,844) [1]			(79,108,406) [2]			(59,940,281) [2]		
	Change in Direct Costs		0			0			(18,164,124)		
	Common Costs		169,821,793			169,821,793			167,355,846		
	Change in Common Costs		0			0			(2,465,947)		

[1] "Calibration Shortfall" is inherent in the methodology.

[2] "Calibration Shortfall" arises from falure to select calibration option.