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OFFICE OF THE SECRETARY

**Before the**
**Federal Communications Commission**
**Washington, D.C. 20554**

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| In the Matter of | ) | |
| | ) | |
| Common Carrier Bureau Seeks Comment on | ) | |
| Translation of Cost Model to Delphi Computer | ) | CC Docket No. 96-45 |
| Language and Announces Posting of Updated | ) | |
| Cost Model | ) | |
| | ) | |

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## TABLE OF CONTENTS

INTRODUCTION AND SUMMARY ..... 1

ARGUMENT ..... 2

I. THE UPDATED USF COST MODEL SHOULD INCORPORATE CERTAIN "IMPLEMENTATION" IMPROVEMENTS ..... 2

A. The Universal Service Cost Model Should Use A More Efficient Drop Terminal Orientation. ..... 3

B. The Universal Service Cost Model Should Correctly Size And Configure Lots. ..... 3

C. The Universal Service Cost Model Should Properly Size Outside Plant Equipment. ..... 4

D. The Universal Service Cost Model Should More Accurately Distribute Residual Lines. ..... 4

E. The Universal Service Cost Model Should Eliminate Inconsistencies In The Universal Service Cost Model's Expense Modules. ..... 6

F. The Universal Service Cost Model Should Use Distance Criteria, Not Cost Criteria To Determine Cable Routes. ..... 6

G. The Universal Service Cost Model Should Locate Customers Using A Consistent Methodology. ..... 7

II. THE UPDATED UNIVERSAL SERVICE COST MODEL SHOULD INCORPORATE IMPROVEMENTS TO THE MODEL PLATFORM. ..... 8

A. The Universal Service Cost Model Should Use Actual Customer Location Data To Accurately Measure Cable Route Distance. ..... 8

B. The Universal Service Cost Model Should Reflect Structure Sharing Between Feeder And Distribution Facilities. ..... 11

C. The Universal Service Cost Model Should Determine Whether A Wire Center In The Model Uses A Host/Standalone Or Remote Switch Based On Forward-Looking Principles. ..... 12

D. The Universal Service Cost Model Should Use Forward-Looking Structure Sharing Rates. ..... 14

III. THE UPDATED USF MODEL SHOULD USE FORWARD-LOOKING INPUTS. ..... 15

A. The Universal Service Cost Model Should Reflect An Accurate Estimate Of The Distribution Plant Mix For Underground And Aerial Cable. ..... 15

B. The Universal Service Cost Model Should Reflect An Accurate Estimate Of Prices for Underground Cable. ..... 16

C. The Universal Service Cost Model Should Use Updated Data Relating To Digital Loop Carrier Equipment. ..... 16

IV. THE UNIVERSAL SERVICE COST MODEL SHOULD INCORPORATE ANY OTHER IMPLEMENTATION, PLATFORM, OR INPUTS IMPROVEMENTS THAT HAVE BEEN IDENTIFIED SINCE 1999. ..... 18

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## COMMENTS OF AT&T CORP.

Pursuant to the Commission's *Notice*,[1] AT&T Corp. ("AT&T") submits these comments relating to the proposed translation of the computer program used to compute universal service eligibility, assessments and distributions from Turbo Pascal to Delphi.

## INTRODUCTION AND SUMMARY

Turbo Pascal is a venerable computer language that has been capable of modeling the complex cost systems necessary to determine carriers' universal service eligibility and support amounts. Delphi is a more modern language that is also capable of carrying out those functions. Accordingly, AT&T does not object to the Commission's proposed use of Delphi for the purpose of computing carriers' 2002 universal service support amounts. *See Notice* at 1. In fact, to the extent that such a transition would create an opportunity for the Commission to make

[1] Public Notice, *Common Carrier Bureau Seeks Comment on Translation of Cost Model to Delphi Computer Language and Announces Posting of Updated Cost Model*, CC Docket No. 96-45, DA 01-1458 (June 20, 2001) ("*Notice*").

corrections and adjustments that would improve the accuracy of the universal service cost model, AT&T fully supports that transition.

As telecommunications carriers and state commissions have worked with the Turbo Pascal-based universal service cost model, they have identified certain aspects of the cost model that should be improved to provide more accurate forward-looking cost estimates. Because the translation of the universal service cost model from Turbo Pascal to Delphi would require the Commission to examine and rewrite the cost model's source code, it makes sense for the Commission to contemporaneously implement these improvements to the cost model that would significantly increase its accuracy. These changes are discussed below and fall into three general categories: (1) corrections to the modules that would better implement the Commission's stated objectives; (2) improvements to the cost model platform that would improve the model's ability to accurately compute forward-looking costs; and (3) improvements to the user-defined inputs used by the cost model that would reflect more accurate real-world conditions.

## ARGUMENT

### I. THE UPDATED USF COST MODEL SHOULD INCORPORATE CERTAIN "IMPLEMENTATION" IMPROVEMENTS.

For the most part, the current Turbo Pascal-based universal service cost model reasonably implements the Commission's stated objectives for estimating carriers' costs. However, AT&T and other carriers have identified a few instances in which the Turbo Pascal computer code that is used to implement the Commission's cost model fails to do so. These shortcomings are easily addressed with slight modifications to the model's computer code and, in most instances, AT&T and MCI WorldCom have already provided the Commission with the computer code necessary to make the corrections.

### A. The Universal Service Cost Model Should Use A More Efficient Drop Terminal Orientation.

The existing Turbo Pascal-based universal service cost model assumes that drop terminals[2] are located toward the northeast corner of each microgrid.[3] As a result, drop terminals are often placed on the opposite side of a customer's lot from the serving area interface ("SAI")[4] that serves that drop terminal. The cost model responds to that inefficient placement of the drop terminal by adding additional cable to connect the opposite side of the customer's lot to the serving SAI. AT&T has provided the Commission with specific Turbo Pascal cost modules that would fix this problem (and that could easily be translated into Delphi code). *See AT&T Feb. 16 Ex Parte* at 5;[5] *AT&T Feb. 28 Ex Parte* at 3-4.[6]

### B. The Universal Service Cost Model Should Correctly Size And Configure Lots.

The Turbo Pascal source code documentation states that the Turbo Pascal-based universal service cost model "minimizes waste lots within a square microgrid, subject to the constraint that lots have lengths no more than twice their widths."[7] In reality, the current cost model fails to carry out this constraint – often allowing a lot's depth to be greater than twice its width. *See AT&T Feb. 16 Ex Parte* at 7. AT&T has provided the Commission with modified

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[2] A drop terminal serves as a junction point for drop wire.

[3] A microgrid is a modeling construct based on a grid overlay of the cluster. A microgrid is one of the squares resulting from the grid overlay.

[4] A SAI acts as a physical interface between the feeder cable connecting a wire center and neighborhood distribution copper cables.

[5] *See* Letter from Richard N. Clarke, AT&T, to Magalie Roman Salas, FCC Secretary, CC Docket Nos. 96-45 & 97-160 (Feb. 16, 2000) ("*AT&T Feb. 16 Ex Parte*").

[6] *See* Letter from Richard N. Clarke, AT&T, to Magalie Roman Salas, FCC Secretary, CC Docket Nos. 96-45 & 97-160 (Feb. 28, 2000) ("*AT&T Feb. 28 Ex Parte*").

[7] This source code is found in the Turbo Pascal program entitled lotdiv.pas.

Turbo Pascal source code (that can easily be translated to Delphi code) that addresses that inconsistency between the existing cost model's documentation and the way that it actually computes lot sizes. *See AT&T Feb. 28 Ex Parte* at 5.

### C. The Universal Service Cost Model Should Properly Size Outside Plant Equipment.

The existing Turbo Pascal-based universal service cost model appears to use inaccurately sized outside plant equipment, resulting in understated costs. For instance, the existing cost model selects drop terminal sizes based on the next *smallest* drop terminal size for a given number of lines. Therefore, if four lines need to be served, the model uses a one-line drop terminal (which would be insufficient) instead of a six-line drop terminal. In a similar fashion, the existing cost model often selects the wrong size manholes. For example, when three ducts are required, the cost model selects an inadequate two-duct manhole rather than a four-duct manhole. These apparent inaccuracies in the existing cost model are well documented, *see, e.g., AT&T Feb. 16 Ex Parte* at 8-9, and should be eliminated in any revised Delphi-based universal service cost model.

### D. The Universal Service Cost Model Should More Accurately Distribute Residual Lines.

The universal service cost model contains several microgrids within each cluster where individual customers "reside." Per customer line-count data is used to distribute the lines to particular microgrids based on the number of customers located in each microgrid. That data includes fractional line counts (*e.g.* 1.4 lines) based on the average number of lines that serve a particular type of customer within a specific geographic region. The cost model, however, requires whole number line count values to be assigned to each microgrid. Consequently, the current cost model rounds any fractional per customer data to the nearest whole number, and

assigns those whole lines to the corresponding customers within each microgrid. The remaining fractional portions are then summed together and randomly assigned to microgrids within a cluster.

If there are two microgrids in a cluster, for example, one with four customers and one with only a single customer, and the average line count per customer in that geographic area is 1.4, the existing cost model would round that average line count to one (1) and would distribute four lines to the microgrid with four customers and one line to the microgrid with a single customer. The remaining fractional lines in each microgrid would then be summed (0.4 x 5 = 2) and these "residual" lines would be randomly distributed among the two microgrids in the cluster. If the random distribution of these residual lines resulted in both lines being assigned to the microgrid with only one customer, then that customer would be served by a total of three lines (or three lines per customer), whereas the microgrid with four customers would be served by four lines (or only one line per customer). That result obviously makes no sense and could misstate costs.

To fix this problem, the cost model should multiply the fractional average per-customer line counts by the number of customers in each microgrid before computing the residual. Applying this solution to the example above, the cost model would determine the number of lines for the microgrid with four customers by multiplying the average line counts by four (1.4 x 4 = 5.6) and round that number to the nearest whole number (*i.e.* six). The residual number of lines from that microgrid would be -0.4. The total number of lines assigned to the microgrid with only one customer would be one (1) with a residual of 0.4. The total number of residual lines would be summed (-0.4 + 0.4 = 0). This approach would more accurately reflect the number of lines that are required to serve customers in each microgrid and reduce the number

of lines that are randomly distributed among microgrids. Correcting this error in the Delphi-based universal service cost model would be straightforward: the Commission can simply modify the Turbo Pascal module provided by AT&T that fixes the residual line count problem for the existing cost model. *See AT&T Feb. 28 Ex Parte* at 5.

### E. The Universal Service Cost Model Should Eliminate Inconsistencies In The Universal Service Cost Model's Expense Modules.

The current universal service cost model contains an internal inconsistency that causes monthly cost estimates to vary slightly depending on whether those costs are computed using the wire center expense module or the density zone expense module. Such inconsistencies are confusing and could result in the selection of slightly less accurate cost estimates. This cost reporting inconsistency is easily fixed by changing the way in which the two expense modules compute costs. *See Ex Parte* Letter From Chris Frentrup, MCI WorldCom, to Magalie Roman Salas, FCC Secretary, CC Docket Nos. 96-45, 97-160 (filed Oct. 14 1999). MCI WorldCom has provided the Commission with the appropriate modifications. *See id.* These minor modifications should be incorporated into the new Delphi-based version of the universal service cost model.

### F. The Universal Service Cost Model Should Use Distance Criteria, Not Cost Criteria To Determine Cable Routes.

The existing universal service cost model uses a myopic optimization algorithm to determine the order in which nodes are connected to the network.[8] This algorithm, called the

[8] A node in the Prim algorithm is a drop terminal location. Note that the term "myopic" is one of art in optimization theory. It does not mean that the algorithm is inferior, only that it serially selects an individual next node to connect, and does not simultaneously and globally select the order of connection of all nodes.

"Prim" algorithm, makes these calculations based on cost per incremental line attached.[9] Because of this assumption, the existing cost model connects more densely populated SAIs before connecting closer, but less densely populated SAIs. *See AT&T Feb. 28 Ex Parte.* While this may minimize that segment's per-line costs, the cost model will often choose a route that is inefficient for connecting subsequent nodes to the network, and therefore uses more plant than is necessary to connect those nodes. *See id.* This inefficient result should be remedied by modifying the Prim algorithm in the cost model so that it determines the order in which nodes are connected to the network based on distance instead of per-line incremental costs. *See AT&T Feb. 16 Ex Parte.* AT&T has provided the Commission with such a modification that is written in Turbo Pascal. *See AT&T Feb. 28 Ex Parte* at 5. That modification should be translated into Delphi and incorporated in to any updated universal service cost model.

### G. The Universal Service Cost Model Should Locate Customers Using A Consistent Methodology.

The Turbo Pascal-based universal service cost model uses inconsistent customer location methodologies depending on whether a customer is located in the middle of a cluster or near the edge of a cluster. For customers located in microgrids in the middle of a cluster, the current cost model uniformly distributes those customers within the microgrid. But customers that would otherwise be located in microgrids near the edge of a cluster are instead often placed in a 500-foot "buffer zone" that the cost model artificially places around clusters.[10] *See AT&T*

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[9] *See* Computer Modeling of the Local Telephone Network, October 1999 at 12 ("[r]ather than minimizing the distance from an unattached node tot he existing network, the [Prim] algorithm minimizes the total cost of attaching an unattached node, and of constructing all of the lines that are required to carry traffic from that node back to the central office").

[10] This methodology often results in placing customers in "no-mans land" or in other clusters and microgrids that are already populated.

*Feb. 16 Ex Parte.* In other words, the current cost model artificially "spreads out" customers who are located near the edge of a cluster, which increases the amount of structure and cable and other equipment needed to serve those customers. *See id.* This inconsistent treatment of customers located on the edge of a cluster compared to those located in the middle of a cluster is well documented. *See AT&T Feb. 16 Ex Parte.* AT&T has provided the Commission with modified Turbo Pascal code that addresses that problem. *See AT&T Feb. 28 Ex Parte.* That Turbo Pascal code should be translated into Delphi and incorporated into any updated universal service cost model.

## II. THE UPDATED UNIVERSAL SERVICE COST MODEL SHOULD INCORPORATE IMPROVEMENTS TO THE MODEL PLATFORM.

In addition to the implementation issues described above, the current universal service cost model platform reflects certain assumptions that significantly over- or underestimate costs. Those model platform issues are well documented and easily fixed. Accordingly, those issues also should be addressed as the Commission translates the universal service cost model from the Turbo Pascal computer language to Delphi.

### A. The Universal Service Cost Model Should Use Actual Customer Location Data To Accurately Measure Cable Route Distance.

The current universal service cost model uses road surrogate data to estimate customer locations, *see Tenth Report and Order* ¶ 37,[11] and that assumption has been proven to introduce significant upward bias in costs when measured on a study area basis. *See* Comments of AT&T, *Federal State-Joint Board on Universal Service, Forward-Looking Mechanism for*

[11] Tenth Report and Order, *Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*, CC Docket Nos. 96-45 & 97-160, (rel. Nov. 2, 1999) ("*Tenth Report & Order*"), aff'd *Qwest Corporation v. FCC*, No. 99-9546 (10th Cir. July 31, 2001).

*High Cost Support for Non-Rural LECs,* CC Docket Nos. 96-45 & 97-160 at 3-4 (filed August 28, 1998).[12] In particular, road surrogate information produces an overestimation of plant because road surrogate models, which uniformly disperse customers along roads, fail to account for the fact that in reality, customers are distributed in a more concentrated fashion, which allows customers to be served more efficiently. *See id.*[13]

The Commission has recognized that "the most accurate data for locating customers within wire centers are precise latitude and longitude coordinates for those customers' locations" – *i.e.* geocode data. *Tenth Report & Order* ¶ 37. Specific customer locations are readily available from incumbent LECs who have detailed records of the location of their customers. These data could be geocoded to identify the exact longitude and latitude coordinates of each customer,[14] and this information could be incorporated into the Delphi-based universal

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[12] *See also* Kansas Corporation Commission, *Order 16: Determining the Kansas-Specific Inputs to the FCC Cost Proxy Model to Establish a Cost-Based Kansas Universal Service Fund,* Docket No. 99-GIMT-326-GIT, ¶¶ 38, 44 (Dec. 29, 1999) ("*Kansas Order*") (reducing the distribution distance produced by the Synthesis Model by 15% because "use of road surrogate data rather than geocoded customer location data tends to systematically overestimate the amount of cable 'deployed' by the model, which in turn systematically overestimates the cost of universal service . . . [and] a comparison of embedded cable quantities to cable quantities produced by application of the model using the road surrogate data shows that cable quantities produced by the model are greater than the quantities in place today"). It is also telling that the distribution distance produced by the Synthesis Model's road surrogate data is more than twice that produced by BellSouth's cost proxy model in Florida – which uses 90% geocode customer location data. *See* Letter from Michael R. Lieberman, AT&T, to Magalie Roman Salas, FCC Secretary, *Federal-State Joint Board On Universal Service,* CC Docket Nos. 96-45, 97-160 (Oct. 4, 2000) ("*AT&T October 4 Ex Parte*").

[13] *See also* Letter from Celia Nogales, Ameritech, to Secretary, FCC, CC Docket No. 96-45, 97-160 (July 14, 1999) (satellite photos showing more clustering of customer locations that is implied by the Commission's surrogate road locations).

[14] In fact, the incumbent LEC customer location databases are likely to already be geocoded. For example, BellSouth uses a geocode customer location database to compute its costs. *See* Direct Testimony of Mr. James W. Stegeman on Behalf of BellSouth Communications, *Investigation Into Pricing of Unbundled Network Elements,* Docket No. 990649-TP, at 2 (filed May 1, 2000)
(continued)

service cost model. Thus, incumbent LECs should be required to provide geocode (or geocodable) customer location information to the Commission for use in the Delphi version of the universal service cost model.[15]

Alternatively, road surrogate data could be replaced by the geocoded customer location database that is maintained by TNS Telecom (formerly PNR & Associates). These data are largely consistent with the current customer location dataset and could readily be incorporated into the new Delphi-based universal service cost model. The Commission's previous concern that the TNS data is not easily verifiable by the public is outdated given that TNS now allows third parties to remotely access its data in order to verify its accuracy.

Even if there are delays before the Commission is able to incorporate actual customer location data into the Delphi-based universal service cost model, the Commission should address immediately a related problem with the current customer location methodology. Instead of establishing single physical locations with multiple lines for customers who are located in the same building (*e.g.*, an apartment complex or a business), the model's current methodology assumes that these customers are uniformly dispersed along roadways (*i.e.* living at

("BellSouth made use of customer specific data such as service addresses (already contained within billing systems) by geocoding each customer address").

[15] Incumbent LECs' claims that their customer location and line count data are competitively sensitive and must be protected from disclosure are clearly baseless – everyone already knows that incumbent LECs either provide (or have the capacity to provide) service to practically all customers in their service areas. The incumbents' line count and customer location data thus stands on an entirely different footing than competitive LECs' confidential line count and customer location data that could be used by incumbents to target their marketing to impede emerging competition. *See* Comments of AT&T Corp., *Local Competition and Broadband Reporting,* CC Docket No. 99-301 at 14-33 (filed March 19, 2000). In all events, the Synthesis Model uses "BIN" files that contain encoded customer location data. The FCC could easily encode the LECs' customer location data and produce "BIN" files that would maintain any underlying proprietary customer location information.

different physical locations). This flawed methodology overstates costs by significantly overstating the number of physical customer locations and the corresponding amount of physical plant required to serve those customers. If the customer location data are updated to reflect actual customer locations as discussed above, this problem would be resolved. However, if the Delphi-based universal service cost model continues to rely on surrogate customer location data, then that cost model should, at a minimum, be modified so that it no longer artificially assumes that customers living at the same physical location live at different physical locations.[16]

### B. The Universal Service Cost Model Should Reflect Structure Sharing Between Feeder And Distribution Facilities.

The existing Turbo Pascal-based universal service cost model computes feeder structure and placement costs based on the (incorrect) assumption that separate plant structures (*e.g.* telephone poles or trenches) are required for feeder and distribution facilities. In reality, feeder and distribution plant often share the same structure facilities. *See, e.g., Kansas Order* ¶¶ 52, 54 (the Kansas Corporation Commission reduced feeder structure and placement costs produced by the Synthesis Model because its "Staff examined the placement of feeder and distribution cable for 14 selected wire centers [and] in every case, at least 40 percent of the feeder routes also included distribution cable. In some wire centers the percentage was much higher"). Accordingly, the universal service cost model should account for this type of structure

[16] It is imperative that the Commission address this multi-customer location issue before it updates customer location or road data to compute costs (as recommended above). The updated customer location datasets likely would include more customers living in apartment complexes and similar locations and, therefore, using that data without first modifying the way that the cost model treats customers that are located in the same building would further overstate costs. *See* Opposition of AT&T Corp. to Sprint Corporation's Petition for Reconsideration, *Federal State-Joint Board on Universal Service*, CC Docket No. 96-45, at 2-4 (filed Feb. 27, 2001).

sharing.[17] And until the cost model platform has been changed to account for distribution and feeder structure sharing, the structure and placement costs in the cost model should be reduced by at least 40 percent to reflect the savings associated with such sharing. *See Kansas Order* ¶¶ 52, 54.

### C. The Universal Service Cost Model Should Determine Whether A Wire Center In The Model Uses A Host/Standalone Or Remote Switch Based On Forward-Looking Principles.

The existing universal service cost model uses the incumbent LECs' switching locations, as identified in the Local Exchange Routing Guide (or "LERG"), to determine whether a particular wire center in the model should house a host/standalone or remote switch. But the LERG database reflects only the incumbent LECs' historical determinations to deploy host/standalone versus remote switches. Even assuming that the incumbent LECs' existing wire centers remain in the same locations – as the current universal service cost model does – the historical determinations regarding remote versus host/standalone switches cannot be relied on in a forward-looking model. These technology choices were developed when LECs faced different relative costs for host/standalone versus remote switches, and different strictures as to their interoffice transport networks. For example, embedded LERG assignments of switches as host/standalones or remotes are inconsistent with the Commission's forward-looking interoffice transport architecture that directs host/remote systems to be placed on separate SONET rings.[18]

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[17] In fact, BellSouth's own cost model shows significant sharing of routes between distribution and feeder facilities. *See AT&T October 4 Ex Parte* (demonstrating that over 70 percent of BellSouth's feeder facilities share routes with its distribution facilities).

[18] Placing hosts and remotes on their own SONET rings is both highly expensive, and not common practice. Indeed, it is unlikely that the incumbent LECs' switch placement guidelines reflect the use of SONET rings for host/remote systems because many remotes, as specified by the LERG, are too small to be economically placed on a ring. In any event, the use of the LERG in combination with this assumption produces a vast overstatement of the necessary interoffice
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Applying forward-looking principles to existing wire centers would result in deployment of fewer (expensive) standalone switches and more (less expensive) remotes. Placement of additional remotes is dictated not only by new geographic growth patterns but also by the dramatic technological changes in the capacities of remote switches. The embedded LERG data do not reflect these forward-looking principles, and therefore, continued reliance on the LERG database to model the type of switches used in a wire center would significantly overstate forward-looking costs.

For these reasons, the updated universal service cost model should abandon the use of the embedded LERG database for determining host/standalone versus remote switch deployment. Instead, the universal service cost model should be based on an optimization algorithm based on a forward-looking network. To the extent that such a transition is not implemented immediately, the LERG database used by the universal service cost model should be updated to reflect more recent deployment decisions.[19]

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cost because expensive electronics and costly redundant transport are being amortized over too few subscribers. Given the Commission's SONET requirement for interoffice transport, a necessary consideration for determining forward-looking host-remote relationships is its impact on SONET ring structure costs. *See* Comments of AT&T Corp. and MCI WorldCom Inc., *Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs,* CC Docket Nos. 96-45 & 97-160, at 23-24 (filed July 23, 1999) ("AT&T/MCI July 23 Comments"); AT&T's Petition for Reconsideration, *Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs,* CC Docket Nos. 96-45 & 97-160, at 15-16 (filed Jan. 3, 2000) ("AT&T Recon. Petition").

[19] To the extent that the Commission updates the customer location process, the LERG data must also be updated to ensure consistency in the wire center definition of the customer location process and the switch location.

### D. The Universal Service Cost Model Should Use Forward-Looking Structure Sharing Rates.

The structure sharing percentages that are used in the existing universal service cost model assign too large a share of structure costs to the LEC.[20] The Commission has frankly acknowledged that its structure sharing rates may be too low given that "further sharing opportunities will exist in the future" and that the structure sharing assumptions should be "revisited in the future." *Id.* ¶ 247.

Structure sharing incentives have strengthened in recent years, not only by competitive forces, but also by regulatory devices such as the Telecommunications Act of 1996, which requires attachers to pay for two-thirds of the non-usable space on poles, ducts, conduits, and rights-of-way. 47 U.S.C. § 224(e). In addition, an increasing number of municipalities are adopting similar regulations that require utilities and telecommunications companies to coordinate their efforts to deploy capacity to customers and to share their structures.[21] And builders have also recognized the cost benefits of using a single trench to facilitate placement of

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[20] *See Tenth Report & Order* ¶ 243. (adopting for "aerial structure . . . 50 percent of structure cost in density zones 1-6 and 35 percent of the costs in density zones 7-8 to the telephone company" and for "underground and buried structure . . . 100 percent of the cost in density zones 1-2, 85 percent of the cost in density zone 3, 65 percent of the cost in density zones 4-6, and 55 percent of the cost in density zones 7-9 to the telephone company").

[21] *See, e.g.,* "Can You Dig It?" Interactive Week (February 14, 2001) ("[Telecommunications] [c]arriers said they have been asked to share trenches [for laying cable] in Albany, N.Y.; Baltimore; Boston; Dearborn, Mich.; Minneapolis; Salt Lake City; and White Plains, N.Y. Also considering the practice . . . are Washington, D.C.; the California cities of Berkley, Oakland, Palo Alto, Santa Clara and Sunnyvale; and in some Los Angeles Suburbs."). For example, the City of Boston requires telecommunications carriers "constructing new conduit to notify all interested telecommunications providers of their intent to cut the street and to offer these providers the opportunity to have their own conduit installed at the same time. Under this policy, participants in approved projects share the costs of excavation, conduit and construction . . . and street resurfacing." *See Cablevision of Boston v. Public Improvements Commission of the City of Boston,* 184 F.3d 88, 92 (1st Cir. 1999) (denying a request for a preliminary injunction against the city's policy).

wires and to minimize cable cuts.[22] In many of those circumstances, the incumbent LEC pays *none* of the cost of trenching. *See id.* As the Commission transitions to a Delphi-based universal service cost model, the structure sharing inputs should be updated to reflect the Commission's concerns and recent trends.

## III. THE UPDATED USF MODEL SHOULD USE FORWARD-LOOKING INPUTS.

The Turbo Pascal-based universal service cost model relies on numerous inputs to estimate carriers' costs. Some of the inputs used by the Turbo Pascal-based universal service cost model are outdated or rely on backward-looking deployment decisions. It would be appropriate, therefore, for the Commission to obtain more accurate or updated inputs before it begins to use its newly-written Delphi-based universal service cost model to estimate costs.

### A. The Universal Service Cost Model Should Reflect An Accurate Estimate Of The Distribution Plant Mix For Underground And Aerial Cable.

The Turbo Pascal-based universal service cost model uses default values for distribution plant mix that call for too much underground cable and too little aerial cable. For instance, the percentage of distribution plant that the current cost model assumes is underground in the BellSouth-Florida serving area is 11 percent. But this figure is more than *five times* the maximum percentage reported by BellSouth for *any* of its states. *See, e.g.,* AT&T Recon. Petition at 10 & n.10. Because BellSouth serves over 24 million switched access lines in nine states, this is very powerful evidence that the default input assumes far too much underground cable. Thus, the Delphi-based universal service cost model distribution plant mix defaults should be adjusted to reflect the fact that the portion of cable that is underground cable rarely

[22] *See id.*; HAI Inputs Portfolio (Jan. 27, 1998) at App. B, p. 156.

exceeds two percent – the maximum amount reported by BellSouth for any of its nine states. *See id.*

### B. The Universal Service Cost Model Should Reflect An Accurate Estimate Of Prices for Underground Cable.

The *Tenth Report & Order* states that its estimate of the prices for 24- and 26-gauge aerial, underground, and buried copper cable of various pair sizes are based on a National Regulatory Research Institute ("NRRI") study of actual cable installation cost data collected by the Rural Utilities Service ("RUS"). *See id.* ¶ 105 & App. B ¶ 24.[23] But the values actually used by the Commission's Turbo Pascal-based cost model for the cost of small underground copper cables are more than *double* the values in that notice. *See Tenth Report and Order,* App. A at A-2 to A-3. As the Commission transitions to a Delphi-based universal service cost model, it should address this plain error by ensuring that the Delphi version of the universal service cost model uses the correct values for small underground copper cables as set out in its *Inputs Further Notice,* App. A at 2.

### C. The Universal Service Cost Model Should Use Updated Data Relating To Digital Loop Carrier Equipment.

The input costs for Digital Line Carrier systems ("DLCs") that are used in the existing Turbo Pascal-based universal service cost model significantly overstate carriers costs. In particular, current DLC inputs fail to account for recent declines in DLC equipment prices during the past several years and the fact that the increased use of integrated DLC (or "IDLC") results in significant savings in switching costs.

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[23] Further Notice of Proposed Rulemaking, *Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*, CC Docket Nos. 96-45 & 97-160 (rel. May 28, 1999) ("*Inputs Further Notice*"). The proposed rates for 24- and 26-
(continued)

*Equipment Costs.* The default DLC values are based on "an average of contract data" proposals of the incumbent LECs. *Tenth Report & Order* ¶ 274. These data are flawed. AT&T and WorldCom have engaged in an extensive examination of that data and have been unable to find any instance in which the incumbent LEC contract data actually support the adopted value. *See* AT&T Recon. Petition at 12; AT&T/MCI July 23 Comments at 32-34. The incumbent LEC's actual prices, to the extent they have been revealed, support DLC costs that are far below those that are used in the model,[24] and are fully consistent with alternative figures proposed by AT&T and MCI WorldCom in the universal service cost model inputs proceeding. *See* AT&T/MCI July 23 Comments at 32-35 & Exh. B.[25]

*Switching Cost Adjustment.* The existing universal service cost model makes no adjustments of any kind to its switching cost data sets to account for the extra savings that the LECs would enjoy if they employed integrated DLCs ("IDLCs") to the degree prescribed by the Commission's cost model. Verizon's own expert witness has conceded that an IDLC switch port termination should cost between $8 and $28 less than an analog interface. *See* AT&T Recon. Petition at 15 (citing Declaration of Nancy Sayer on Behalf of Bell Atlantic, *In re NYNEX Corp. and Bell Atlantic Corp. Application for Consent to Transfer of Control* at 5 ¶ 11, Tracking No. 960205, 960221 (October 22, 1996). Furthermore, because IDLC lines do not require MDF to

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gauge underground cables of less than 50 pairs ranged from $1.93 to $2.46 per foot. *Id.,* App. A at 2.

[24] That finding is supported by a recent study finding that DLC prices have fallen by about 7 percent per year for the past several years. *See* RHK, *Access Network Systems: Market Forecast,* at 1-28 (February 29, 2000).

[25] As pointed out by AT&T's January 3, 2000 Petition for Reconsideration, the incumbent LEC claims that AT&T's and MCI WorldCom's analysis "omit[ted] the costs for line equipment" is plainly false. AT&T Recon. Petition at 12. That analysis clearly accounted for the costs of line equipment in a line item entitled "Line POST Card." *Id.*

terminate at the switch, the $12.00 MDF investment used for analog switches should also be removed from all IDLC lines. Thus, there is no question that per-line IDLC cost savings fall somewhere between $20 (as conceded by Verizon's cost witness) and $40 (after accounting for no MDF). Taking the midpoint of these values would suggest that lines served by IDLC have associated switch costs that are about $30 less than analog lines. The Commission's switch cost data sets should be adjusted so that these savings are applied to the fraction of lines that the model prescribes be served by IDLC that is in excess of the embedded fraction of IDLC lines that is implicit in the embedded switch data.[26]

## IV. THE UNIVERSAL SERVICE COST MODEL SHOULD INCORPORATE ANY OTHER IMPLEMENTATION, PLATFORM, OR INPUTS IMPROVEMENTS THAT HAVE BEEN IDENTIFIED SINCE 1999.

The current version of the universal service cost model was implemented in 1999. The issues discussed above are, for the most part, well documented and already known to the Commission. However, to the extent that state commissions or other entities have identified other valid issues that would improve the accuracy of the universal service cost model, those improvements should also be incorporated into the updated version of the cost model. Indeed, any changes to the cost model that would improve its accuracy should be considered by the Commission.

[26] The current cost model significantly underestimates the percentage of lines served by DLC. Recent runs of the forward-looking synthesis model produced a 40 percent average penetration value of DLC, which is significantly higher than the 18.3 percent penetration rate currently used to compute universal service payments. *See* AT&T Recon. Petition at 15.

## CONCLUSION

For the reasons stated above the Commission should make the foregoing corrections and adjustments as it translates the computer program used to compute universal service eligibility, assessments and distributions from Turbo Pascal to Delphi.

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I, Hagi Asfaw, hereby certify that on this 13th day of August, 2001, a copy of the foregoing "Comments of AT&T Corp." was served by hand-delivery upon the parties listed below:

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