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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of	)	
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs	)	CC Docket No. 97-160

PETITION OF GTE FOR RECONSIDERATION OF THE COMMISSION'S TENTH REPORT AND ORDER

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SUMMARY

The Commission should vacate the Tenth Report and Order (and the FCC Model inputs adopted therein) and re-open this consolidated docket for further proceedings for several reasons. First, the Commission did not give GTE an opportunity to analyze and comment on all of the adopted inputs, or on the FCC Model platform in which they are to be used, before they were adopted. Following issuance of the Tenth Report and Order, the Commission released a new, allegedly corrected version of the FCC Model platform. The Commission was obligated to make that version of the FCC Model platform available before adopting the inputs to be used therein. By failing to do so, the Commission prevented GTE from fully analyzing or commenting upon the proposed set of input values. Second, many of the adopted input values are derived from faulty, result-oriented analysis. Third, the Commission's reasons for selecting certain input values are inconsistent with its reasoning for adopting other input values. Fourth, the adopted input values systematically understate costs.

For these reasons, the Commission should set aside the Tenth Report and Order and give GTE and other interested parties the opportunity to comment on both the final FCC Model platform and proposed input values.

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PETITION OF GTE FOR RECONSIDERATION OF THE COMMISSION'S TENTH REPORT AND ORDER

GTE Service Corporation and its affiliated domestic telephone operating companies ("GTE"), pursuant to 47 U.S.C. § 405 and 47 C.F.R. § 1.429, respectfully petition the Federal Communications Commission ("FCC" or "Commission") to reconsider and set aside its Tenth Report and Order ("Order") in the above-captioned docket.[1]

I. INTRODUCTION

In this petition, GTE urges the Commission to remedy serious procedural errors in the way its universal service cost model platform and input values were adopted. In the course of this combined docket, interested parties have evaluated and commented on four separate cost models -- BCPM, HAI Model

[1] In the Matter of Federal-State Joint Board on Universal Service, In the Matter of Forward-Looking Mechanism for High Cost Support for Non-Rural LECs, CC Docket Nos. 96-45, 97-160, *Tenth Report and Order*, FCC 99-304 (rel. Nov. 2, 1999). This docket – CC Docket Nos. 96-45 and 97-160 – is hereafter referred to and cited as the "Universal Service Cost Model Docket." The GTE affiliated domestic telephone operating companies are GTE Alaska, Incorporated, GTE Arkansas Incorporated, GTE California Incorporated, GTE Florida Incorporated, GTE Hawaiian Telephone Company Incorporated, GTE Midwest Incorporated, GTE South Incorporated, GTE

(formerly known as Hatfield), TECM, and HCPM. Following the October 1998 release of the Commission's Fifth Report and Order,[2] interested parties have reviewed and analyzed a dozen iterations of yet a fifth model, the Commission's so-called "synthesized" model ("FCC Model" or "Model"), which was comprised of a new combination of elements from BCPM, HAI Model and HCPM, new optimization routines, new software interfaces, and new algorithms.[3] The piecemeal adoption of the FCC Model's platform has left parties to "comment" upon elements of the Model, without knowing how the elements function in relation to each other. By deferring development of some of the Model's key "platform" components, including an algorithm to locate customers, until the inputs phase of this proceeding, and then making significant changes to the platform after the adoption of the input values to be used in the Model, the Commission has engaged in arbitrary and capricious rulemaking and denied GTE its basic due process rights.

Unfortunately, the input values adopted in the latest Order are the result of a similar process, having been effectively shielded by the Commission from public inspection and meaningful analysis or comment. As GTE and others have stated in Comments and Reply Comments filed in response to the Commission's proposed set of input values, it is impossible to determine conclusively whether

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Southwest Incorporated, Contel of Minnesota, Inc., GTE West Coast Incorporated, and Contel of the South, Inc.

[2] Universal Service Cost Model Docket, *Fifth Report and Order*, FCC 98-279 (rel. Oct. 28, 1998).

[3] The Commission developed this new Model on its own initiative and without subjecting it to prior public inspection or comment. For these reasons, and those set forth in the Petition of GTE for Reconsideration of the Commission's Fifth Report and Order, the FCC Model is not supported by the evidence in the record, violates the Commission's own rules, including its ten cost model criteria, and was the product of arbitrary and capricious rulemaking.

an input value is reasonable and appropriate unless it is known exactly how the input is used within the final Model platform, an opportunity which GTE never had.[4]

The partial analysis that GTE has been able to conduct due to the irregular manner in which the Commission has released information revealed that many of the input values proposed and now adopted by the Commission are based on flawed and inconsistent reasoning, and produce results that are biased toward low costs. Moreover, even at this late stage, GTE has been unable to replicate the results produced by the Commission using the platform and inputs available on the Commission's web page.[5]

The remedy for these procedural and substantive defects is to set aside the Order, and permit interested parties to review and comment upon the FCC Model as a whole (platform and inputs), including all of its underlying data and information.

II. ARGUMENT

A. The Commission Never Gave GTE An Opportunity To Analyze And Comment On All Input Values Or The Final Version Of The FCC Model Platform.

The Commission violated fundamental legal principles applicable to administrative rulemaking by failing to give GTE an opportunity to submit evidence and comment upon the input values that it proposed be used in the final

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[4] Universal Service Cost Model Docket, *Comments of GTE Service Corporation and Its Affiliated Domestic Telephone Operating Companies in Response to Further Notice of Proposed Rulemaking* (July 23, 1999) at pp.3-9 ("GTE Comments").

[5] In addition to the platform and inputs available on the Commission's web page, a user must also obtain certain data from PNR Associates, Inc., which the Commission has never made available, to run the Model.

version of the FCC Model platform.[6] The Commission's failure to release the final version of the Model platform until after the adoption of the inputs deprived GTE of its right to comment. Thus, the Order, its inputs and the Model platform, as currently adopted, are arbitrary, capricious, an abuse of discretion, deny GTE due process, and are not otherwise in accordance with law.[7]

The Commission's own regulations prescribe the procedures that it should have followed in adopting a new universal service cost model platform and inputs.[8] Those regulations require the Commission to commence a rulemaking by publishing a notice stating "either the terms or substance of the proposed rule or a description of the subjects and issues involved."[9] The applicable regulations mandate that the Commission afford GTE the opportunity to provide comments and develop evidence in the record on whether the proposed inputs are reasonable when run in the final Model platform. The essential inquiry here or in any future review of the Order is simple: did GTE have a fair opportunity to present its views on the new rule.[10] In this case, as with the platform itself, the answer is no.

The Commission gave GTE no meaningful opportunity to file comments on the proposed input values before they were adopted. While GTE was able to analyze proposed input values in the abstract and run them through an interim

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[6] *See* 5 U.S.C. § 553; 47 C.F.R. § 1.411 *et seq.*

[7] *See* 5 U.S.C. § 706(2).

[8] *See* 47 C.F.R. §§ 1.411-1.430 (embodying the statutory requirements of Section 553 of the Administrative Procedure Act, 47 U.S.C. § 553 *et seq.).*

[9] 47 C.F.R. § 1.413.

[10] *See Chocolate Manufacturer's Ass'n v. Block*, 755 F.2d 1098, 1104 (4th Cir. 1985).

(and flawed) version of the FCC Model platform, it was not able to analyze whether combining the inputs and platform produced reasonable results because GTE never had access to the final Model platform during the comment period. The inputs and the platform are interrelated and cannot be separated for purposes of producing a reasonable result. Only the Commission possessed the final version of the Model platform, which it did not make public until after releasing the Order.

The Model is also not supported by the record. An administrative rule, like the Commission's new Model and input values, must be supported by the evidence in the record.[11] A rule (such as the inputs) that is based on inadequate data or data that are not made available for public inspection (such as the final Model platform) is arbitrary and capricious.[12] When an agency adopts a rule consisting of a predictive model -- such as the new FCC Model and inputs -- the agency must be able to provide a full and analytical defense of that rule based on the evidence in the record.[13] There must be a rational connection between the factual inputs, modeling assumptions, modeling results, and the conclusions drawn from those results.[14] The model must work properly and generate reliable results, because imprecise calculations may rise to such a level that any agency

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[11] *See National Black Media Coalition v. F.C.C.*, 791 F.2d 1016, 1023 (2d Cir. 1986).

[12] *Id.*

[13] *Eagle-Pitcher Industries v. E.P.A.*, 759 F.2d 905, 921 (D.C. Cir. 1985).

[14] *Sierra Club v. Costle,* 657 F.2d 298, 333 (D.C. Cir. 1981).

action based upon it becomes arbitrary, capricious, and not otherwise in accordance with law.[15]

Here, because the Commission did not make available the final version of the FCC Model platform until after the final inputs were selected in the Order, there is no legally sufficient way that the Commission could have evaluated the adopted input values based on the public record or given interested parties a meaningful opportunity to comment. The fact that the Commission changed certain data and algorithms underlying the FCC Model, but did not make the final platform available to the public until after the input values were adopted is conclusive proof that the Commission could not have properly adopted the input values based on the public record.

In addition, many input values used in the FCC Model were never made available to GTE for comment. The FCC Model platform adopted in October 1998 incorporated scores of HAI Model default inputs in the end office, tandem switching, SS7 network and interoffice network components even though no inputs had at that time been formally adopted. GTE understood that it would be given the opportunity to comment on these HAI Model default inputs during the inputs phase, many of which are based on nothing more than the undocumented opinion of persons who developed that model.[16] However, these HAI Model default inputs were not among the group specifically identified for comment in the

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[15] *See Tex Tin Corp. v. E.P.A.*, 992 F.2d 353, 354 (D.C. Cir. 1993) (results of mathematical model may be so imprecise as to render action arbitrary and capricious); *Small Refiner Lead Phase-Down Task Force v. E.P.A.*, 705 F.2d 526, 535 (D.C. Cir. 1983) (court may strike down model so oversimplified that agency's conclusions from it are unreasonable).

[16] GTE Comments at pp. 11-12. *See also* HAI Model Release 5.0a Inputs Portfolio (dated January 28, 1998).

FNPRM. They were, in effect, not made available for public comment, but have now been adopted. For example, the Order adopts two factors from the HAI Model's default inputs that reduce the tandem common equipment investments by 40% and 50%.[17] These arbitrary factors were not identified in the FNPRM.

Similarly, in response to Bell Atlantic and Sprint's concern that the line counts generated by the National Access Line Model do not match their actual line counts, the Commission determined that the Model will "true up" the line counts to reflect the 1998 ARMIS line counts.[18] However, since the original customer location data obtained from PNR Associates, Inc. ("PNR") used location counts from 1995/1996, PNR will have to develop a new data set containing 1998 location counts to be consistent with these 1998 ARMIS line counts. GTE has cautioned that the inconsistent use of line and location data would dramatically underestimate costs. Since 1998 location counts have not yet been made available (assuming they exist), GTE has obviously had no chance to comment on them.[19]

For some inputs, the Commission relied on a previously unidentified study by Technology Futures, Inc. ("TFI"), as described in the affidavit of Dr. Zhang (Attachment A). TFI has reviewed the Order and stated unequivocally that the Commission misused its study to set input values relating to main distribution

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[17] *See* RFCC_switching_io_October1999.xls, 'tandem and STP investment'! D12: total common equipment investment. The two reduction factors are inputs!C130 (40%---tandem/EO wire center common factor) and inputs!C89 (50%---common equipment intercept factor).

[18] Order at ¶ 61.

[19] Zhang Affidavit at ¶ 37, attached as Attachment A.

frame ("MDF") and power investments.[20] According to TFI, the actual cost for MDF and power is substantially higher than the FCC's estimate. Properly interpreted, the TFI study should lead to an estimate of at least $45 per line to account for MDF and power.[21]

B. The Inputs Are Derived From Flawed Methodologies.

In addition to the legal and procedural defects outlined above, the Order is badly flawed from a technical perspective.

1. The Use of the NRRI Study Is Flawed.

The NRRI Study, as adopted and used by the Commission, is flawed for several reasons. The arbitrary manipulation of the RUS data will lead to overall costs that are understated. The inadequacy of the data and the flawed methodologies adopted by the Commission will lead to unreliable estimates for the cable and structure cost equations. Since those coefficients determine the relative costs, the unreliable estimates will distort the relative cost relationship, thereby distorting the characterization of high cost and low cost areas, and ultimately the universal service fund. That is particularly true for structure cost inputs, which depend more on the mismatched variables than cable cost inputs. The Commission should discard its flawed use of the NRRI Study and, in the absence of company-specific data, adopt the state data for all structures in all density zones that it adopted for the buried and underground structure cost inputs in density zones 3-9.

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[20] Letter from Roy L. Hodges, Technology Futures, Inc., to Dr. Jason Zhang, GTE (dated December 22, 1999), attached as Attachment B.

[21] Zhang Affidavit at ¶¶ 30-35.

a) Arbitrary Manipulations of Data Lead to Understated Costs.

As explained in Dr. Zhang's Affidavit, the Commission arbitrarily manipulated the RUS data to reduce costs.[22] To begin with, the costs constructed by the NRRI Study authors do not include all relevant costs.[23] Then, high cost contracts are removed from the NRRI data. Finally, the Huber adjustments are applied to further reduce the weight of high cost contracts. These manipulations lead to understated cost estimates using any econometric analysis. Some of the understated inputs are then further reduced by the purchasing power adjustments.

GTE's concern that NRRI contract data do not include all relevant costs is unrebutted. The FCC acknowledged that high cost contracts were removed from the NRRI Study, but claimed the removal was based on *a priori* reasoning or evidence that costs should decrease as density decreases.[24] But, the Commission's own study contradicts that. Since there was no evidence that the excluded expensive contracts were errors,[25] the proper approach would have been to account for them, not eliminate them to seemingly make the data fit the desired results.

The Commission also claimed that the Huber adjustments do not, as GTE argued, diminish the impact of expensive contracts in the data set because the

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[22] Zhang Affidavit at ¶¶ 7-11.

[23] RUS data are also inadequate because RUS companies follow engineering standards that are different from the standards followed by non-rural companies. Murphy Affidavit at ¶¶ 7–9, attached as Attachment C.

[24] Order at ¶ 119.

[25] Order at ¶ 144.

Huber adjustments treat "symmetrically" observations that have high or low values. This is patently incorrect. The Huber adjustments could not have treated high and low cost contracts in the RUS data "symmetrically" because high and low cost contracts did not appear "symmetrically" in the data.[26] Most observations in the RUS data are from the lowest density areas, and after NRRI's removal of high cost contracts, the remaining data reflect only the contracts with easy placement conditions. As a result, the average cost of the contracts is unrealistically low. Furthermore, since contract costs cannot be negative, any contracts that contain extreme values, or "outliers", are more likely to be high cost contracts, relative to the average contract in the data.[27] The outcome is made worse by the Commission's mis-specification of the equations. Having excluded variables that would account for extra costs, legitimately more expensive observations will show up as "outliers" and be discounted. The Commission conceded that those high cost contracts are not mistakes.[28] That is, they must have reflected more difficult placement conditions, such as the need for traffic control and cutting through roads. While those conditions may not be typical in rural areas, they are nonetheless frequent in the non-rural setting, and should have been retained in the data set because the costs of non-rural carriers are the focus of the Model. But, instead of accounting for the high cost

[26] Zhang Affidavit at ¶ 11.

[27] Zhang Affidavit at ¶ 11.

[28] Order at ¶ 144.

characteristics of non-rural carriers, the Commission simply discounted them by way of the Huber adjustments.[29]

Finally, the Commission improperly adopted the buying power adjustments to reduce the NRRI Study cable costs even further, despite substantial evidence from numerous commenting parties, including RUS, that such adjustments were inappropriate. As RUS clearly explained in ex parte comments, the buying power adjustments cannot reasonably achieve their purported objective because there is no evidence that the RUS material costs are necessarily comparable to non-rural ILEC costs.[30] Absent such evidence, the adjustment is, as RUS delicately put it, "imprudent."[31]

b) The Inadequacy of the Data and Flawed Methodology Distort the Relative Costs.

In addition to manipulating data to reduce the overall cable and structure costs, the Commission ignores the fundamental weakness of the data and uses a flawed methodology to estimate cable and structure cost equations. The Commission ignores the geographic mismatch in the RUS data that precludes a cost causative relationship.[32] The Commission misuses ordinal variables as cardinal.[33] The Commission then uses an unrepresentative data set to estimate pole costs, and arbitrarily separates the buried cable and structure costs into two equations. As a result of these fundamental errors, the estimates for the

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[29] Zhang Affidavit at ¶ 11.

[30] *RUS Ex Parte* (dated August 20, 1999).

[31] *Id.*

[32] Zhang Affidavit at ¶¶ 13-15.

[33] Zhang Affidavit at ¶¶ 16-17.

coefficients in the equations are unreliable.[34] Since these unreliable coefficients determine the relative costs across areas, the resulting estimates distort this relative cost relationship, and the universal service fund will be mis-sized.

The Commission did not dispute GTE's claim that there is a mismatch between the dependent and the explanatory variables in the NRRI data, and the bias it causes. That is, the Commission did not dispute that there may not be a cost causative relationship between the modeled costs and the variables it uses to explain them, and that the lack of a causative relationship leads to unreliable cost estimates. However, instead of correcting these errors, the Commission continued to rely on the flawed study because (i) the exact bias is unidentifiable, and (ii) some irrelevant statistics allegedly supported its position.[35] This surely constitutes improper rulemaking. If the purpose of the federal universal service mechanism is now to establish relative cost differences between the states (and it is), unreliable estimates by the Commission will fail that goal and should not be used. Contrary to the Commission's contention, knowledge of the direction of the bias is irrelevant.

In response to GTE's evidence that the NRRI Study uses improper averages of "ordinal" variables relating to soil type, rock hardness and water, the Commission claimed that the statistical findings justify the use of these variables in the structure regression equations.[36] As discussed in Dr. Zhang's affidavit,

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[34] Zhang Affidavit at ¶¶ 19-20.

[35] Zhang Affidavit at ¶¶ 13-15.

[36] Order at ¶ 124.

the significance of a variable does not prove the reliability of the estimates.[37] Unreliable coefficient estimates, even if significantly different from zero, will produce unreliable cost estimates.

The Commission conceded that the number of observations used in the estimate for aerial structure costs was far less than the minimum of 10 times the number of parameters the Commission had previously determined was necessary to produce reliable estimates.[38] Rather than adhering to that standard, the Commission relied on the pole material costs from a different, previously inadequate sample, and contended that GTE failed to prove that only 19 observations produced biased estimates. The Commission's arguments are without merit.

The FCC noted that the estimated material costs (*i.e.*, poles) are similar to averages from the NRRI data and incumbent local exchange carrier responses to certain FCC data requests.[39] The Commission seems to ignore the fact that a linear regression will always produce a mean value identical to the mean of the sample on which the regression is based.[40] Since freight costs and terrain conditions can significantly affect an installed pole's costs, the similarity in material costs for poles does not establish that the adopted estimates are reasonable for installed poles.[41]

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[37] Zhang Affidavit at ¶ 15.

[38] Order at ¶ 123.

[39] Order at ¶ 55.

[40] Zhang Affidavit at ¶ 22.

[41] Zhang Affidavit at ¶ 21.

The Commission's claim that "GTE does not provide any evidence that suggests that a sample size of 19 poles for developing structure costs produces biased estimates" reflects a misunderstanding of econometrics. Econometric analysis is a science of probabilities. Since the Commission's sample is so small, it cannot be representative of the operating conditions for rural or non-rural companies.[42] Sound econometrics analysis would preclude the use of such analysis to infer the costs of non-rural companies, as it will be unreliable. In addition, the explanatory variables in the Commission's equation accounted for less than 30% of the variation in the cost of poles for the rural companies in the sample, making the results of the analysis even more doubtful. Since reliable cost estimates are what the cost model must provide, inputs should be rejected if they are the result of unreliable estimates, even though the exact bias may not be known.

Finally, because the FCC Model populates the structure costs by density and terrain while it populates the cable costs by size and placement, there is no way to ensure for a given quantity of buried cable and structure that the separate calculations in the Model will yield the total costs that would come from the combined FCC equation.[43]

c) NRRI-Based Inputs Lead to Understated Costs, Distort the Relative Cost Relationship, and Therefore Should Be Discarded.

The Commission properly recognized that state-specific cost data from North Carolina, South Carolina, Indiana, Nebraska, New Mexico, Montana,

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[42] Zhang Affidavit at ¶ 22.

[43] Zhang Affidavit at ¶¶ 19-20.

Minnesota, and Kentucky "are more reliable than the extrapolated data" from the NRRI Study,[44] and adopted the state data for the structure cost inputs for underground and buried structure for density zones 3-9. Given the plethora of problems with the use of the NRRI Study, it is inappropriate and illogical for the Commission to rely on it for the aerial structure cost inputs and the underground and buried structure cost inputs for density zones 1 and 2.[45] Since the inputs based on the NRRI Study are so understated, they cause an illogical disconnect in the inputs between density zones 2 and 3.[46] To avoid these problems, the Commission should, in the absence of company-specific inputs, adopt the state data for all structure cost inputs for all density zones.

2. Pole Cost Inputs Should Be Adjusted.

In addition to the above problems with the data and methodology used by NRRI for estimating pole costs, GTE demonstrated in its Comments that the per foot pole investment calculation underestimated pole investment.[47] Regardless of how the total per pole investment is calculated, GTE's rather simple correction is necessary.[48] The Commission refused to make GTE's correction on the grounds that it constituted a change in the Model platform. That reasoning is not rational because the Commission has been changing the Model platform continuously since its release in October 1998, and made platform corrections contemporaneously with its consideration and selection of the input values.

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[44] Order at ¶¶ 220-22.

[45] Zhang Affidavit at ¶ 24.

[46] Zhang Affidavit at ¶ 25.

[47] GTE Comments at p. 51.

[48] Zhang Affidavit at ¶¶ 27-28.

Moreover, the adjustment can be accomplished through an input change, as described in Dr. Zhang's affidavit.[49]

3. DS1's and Switch Fill Factors Are Not Treated Properly.

The Model assumes that a certain percentage of switched business traffic and special access lines are provided over digital facilities (using two copper pairs rather than 24), and adjusts its wire center cable requirements based on this assumption. In order to take advantage of DS1 economies in the real world, however, given the Model's use of 18,000 foot copper loops, HDSL technology with doublers are required in copper loops beyond 12,000 feet.[50] Since the Model includes no costs for HDSL technology, the Model should not be designed to take advantage of the associated pair cost reduction. Reducing the maximum copper loop length to 12,000 feet would solve this obvious flaw.

Similarly, the Commission's administrative switch fill factor of 94% is wrong because it represents an arbitrary compromise between the Commission's misinterpretation of BCPM's switch fill of 88%, and the unsubstantiated, unverifiable, and unrealistic value of 98% from the HAI Model.[51] If a midpoint is to be the basis for this input, the relevant administrative switch fill values should be those submitted by the incumbent LECs, which range from 78% to 88%.

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[49] Zhang Affidavit at ¶ 28.

[50] Murphy Affidavit at ¶ 25.

[51] Murphy Affidavit at ¶¶ 26 - 29.

4. The FCC Model Expense Inputs Are Obviously Flawed.

a) Improper Use of Nationwide Estimates for Expense-to-Investment Ratios.

As with most other input categories, the Commission adopted nationwide average expense-to-investment ratios, and rejected the use of ARMIS study area-specific data for estimating plant-specific operation expenses, contending that "using nationwide averages is a better predictor of the forward-looking costs that should be supported by the federal high-cost mechanism than any particular company's costs."[52] This argument is wrong for two reasons. First, the variations in ARMIS values are due more to intrinsic study area level characteristics relating to geography and other state differences than to company specific factors. Second, developing an average expense-to-investment ratio systematically understates universal service requirements if the high cost areas have a higher expense-to-investment ratio, and it would also lead to errors in allocation of universal service support among study areas.

The Commission contended erroneously that developing study area-specific costs for federal universal service support purposes "would be administratively unmanageable and inappropriate.[53] The ARMIS data already included in the FCC Model contain investments and expenses by study area. The HAI Model, on which the expense module of the FCC Model is based, calculates the expense-to-investment ratio by company using ARMIS data. The FCC Model disables this capability and overrides the default ARMIS ratios with externally calculated numbers. By eliminating this override, the FCC Model can

[52] Order at ¶ 360.

be easily modified to include the national average current-to-book ratios, along with company-specific investment and expense values from the existing ARMIS files, to develop company-specific expense-to-investment ratios.[54]

b) Incorrect Use of Regression Methodology.

The regression methodology for estimating the portion of corporate operations expenses, customer services expenses, and plant non-specific expenses to be supported by the federal high cost mechanism is seriously flawed. The FCC claims that "[i]n accounts 6620, 6700, 6530 the regression explains a high degree of the variability in expense variables."[55] In support of this contention, the FCC cites the wrong R^2 values ranging from 0.92 to 0.965 for those accounts.[56] The correct R^2 values ranged from 0.17 to 0.19. The FCC's error is explained in Dr. Roy's Affidavit, attached hereto as Attachment B.[57] The low R^2 values are mainly due to the omission of relevant explanatory variables. In the absence of data, GTE is not able to explain the likely omitted variables, but even inclusion of local minutes of use, which the Commission omitted, improves the Model and produces higher R^2 values.

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[53] Order at ¶ 356.

[54] The Commission's use of nationwide average values for plant mix was equally improper because such values fail to capture either the forward-looking or embedded costs actually incurred for structure placement due to highly variant local factors, such as terrain, elevation, weather and local requirements. *See* Murphy Affidavit at ¶¶ 21-22.

[55] Order at ¶ 389.

[56] R^2 is a statistic that represents the explanatory power of an econometric equation. It is interpreted as the proportion of variation in the dependent variable (the left hand side of the equation) that is explained by the variation in the set of explanatory variables (right hand side of the equation).

[57] Roy Affidavit at ¶¶ 6-11, attached as Attachment D.

c) Incorrect Removal of One-Time Expenses.

The Commission abandoned its proposal to include one-time expenses in accounts 6530 and 6700 in favor of the flawed AT&T and MCI proposal to reduce estimated expenses in account 6530 by 2.6% and in account 6700 by 20%.[58] Use of 10K and 10Q filings to identify one-time expenses, as suggested by AT&T and MCI, would lead to erroneous results since the level of detail needed to identify these expenses does not exist in these reports. The only way to get data on such one-time expenses would be to obtain them from individual companies.[59] Even if one is able to identify the "one-time" expenses using company provided data, the procedure suggested by AT&T and MCI is incorrect because the concept of an annual average one-time expense is an oxymoron.[60] By definition, a one-time expense is an expense that is unlikely to recur in the future. Yet, AT&T and MCI's analysis is that these one-time expenses, on average, occur every year by each company. The correct procedure would be to remove the identified non-recurring expenses for 1998 using company provided data and then add the average of such expenses using 1993 to 1997 company data to account for the recurring portion of the non-recurring costs in 1998.

d) Incorrect Exclusion Of Relevant Marketing Expenses.

The FCC has abandoned the factor developed by Economics and Technology, Inc. ("ETI") for calculating marketing expenses in favor of a totally

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[58] Order at ¶ 400.

[59] Roy Affidavit at ¶ 18.

[60] Roy Affidavit at ¶ 19.

new method.[61] GTE concedes that the procedure suggested by ETI suffered a number of methodological problems. However, the revised procedure adopted by the FCC also suffers from many infirmities.[62]

First, the Commission's new approach presupposes, without any supporting evidence, that Massachusetts expense data represent the national average. Second, it is inappropriate to use 1998 line data with 1992 expenses. The ratio of primary residence to total residence and single business to total business lines is surely lower in 1998 than in 1992. The Commission should have used 1998 expense data with 1998 lines. In the absence of a 1998 expense study, the FCC should use 1992 line data with 1992 expenses to arrive at a better estimate of the universal service share. Although this data is older, the ratio is justified.[63] In a competitive environment, the ratio of primary residence to total residence and single business to total business lines may be lower, but the share of the expenses for local services in total advertising expenses is likely to be correspondingly higher, thus offsetting each other. The extent of increased advertising that would be needed for local services in a competitive environment is demonstrated by the 1992 expense data showing that more than 60% of advertising expenses pertained to long distance advertising. This was because long distance was a competitive service in 1992, while local service was not.

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[61] Order at ¶¶ 403-07.

[62] Roy Affidavit at ¶¶ 20-23.

[63] Order at ¶ 56 ("AT&T and MCI note 'the key issue is the consistency of the numerator and the denominator.'"); Roy Affidavit at ¶ 21.

The FCC has excluded marketing expenses in accounts 6611 (product management) and 6612 (sales) on the ground that "these marketing activities are not specifically required for support under Section 214 of the Communications Act and currently receive no high cost loop support."[64] Some of the services covered by these two accounts have been part of universal service in a regulated environment, and more will be needed in a competitive environment.[65] Hence, the portion of expenses in accounts 6611 and 6612 that would be needed to provide local service should be included in marketing expenses.

5. The Model's Structure Sharing Inputs Should Be Based On Actual Experience, Not The Commission's Predictive Judgment.

The record contains no better evidence for estimating future structure sharing than the actual structure sharing experiences of existing telephone companies.[66] The fact that commenters may have "diverge[d] sharply" on this issue does not justify the Commission's decision to rely on its own "predictive judgment" about what sharing may occur in the future. The reasonable approach is to adopt inputs values properly derived from current incumbent LEC sharing percentages.

C. The FCC Has Used Inconsistent Reasoning Throughout the Order.

Another problem with the Order is that the Commission has failed to apply consistent reasoning when adopting the inputs.

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[64] Order at ¶ 407.

[65] Roy Affidavit at ¶ 22.

[66] Murphy Affidavit at ¶ 20.

For example, the Commission attempts to justify the adoption of nationwide plant mix values that "may not be exact for every company" on the grounds that they "will be reasonable for all companies."[67] This contention is unsupported by the record and is inconsistent with sound LEC engineering practices which seek to optimize the mix to reflect local geological factors and other requirements.[68] In fact, the Commission, in paragraph 93 of the Order, expressed its belief that varying plant mix by state, study area, or region of the country may more accurately reflect variations in forward-looking costs. Interestingly, the Commission rejected alternatives to nationwide values because the algorithms on the record produced biased results. Yet, in other contexts (*i.e.*, RUS data), it recognized the existence of biases but adopted the data anyway.[69]

The Commission also takes a contradictory approach to the Turner Price Index ("TPI"), using the TPI when suitable to the Commission's purpose, but rejecting it elsewhere. The Commission refused GTE's proposed use of TPI, claiming that it and its underlying data were not public. Yet, the Commission then relied on the TPI to convert 1996 RUS cost data to 1997 levels. These conflicting positions cannot be reconciled, and the Commission's selection of the TPI index for the South Atlantic Region as representative of the entire country is even less supportable.[70]

The Bell Atlantic testimony referenced and used in the NRRI Study also provides another example of the Commission's inconsistent reasoning. The

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[67] Order at ¶ 238.

[68] Murphy Affidavit at ¶¶ 21-22.

[69] Zhang Affidavit at ¶ 13.