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

In the Matter of	)	
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	
High-Cost Universal Service Support	)	WC Docket No. 05-337

ORDER

Adopted: April 25, 2012 **Released: April 25, 2012**

By the Chief, Wireline Competition Bureau:

I. INTRODUCTION

1. In the *USF/ICC Transformation Order*, the Commission comprehensively reformed universal service funding for high-cost, rural areas, adopting fiscally responsible, accountable, incentive-based policies to preserve and advance voice and broadband service while ensuring fairness for consumers who pay into the universal service fund (Fund).[1] As a component of those reforms, the Commission adopted a benchmarking rule intended to moderate the expenses of those rate-of-return carriers with very high costs compared to their similarly situated peers, while further encouraging other rate-of-return carriers to advance broadband deployment.[2] In this order, we adopt the specific methodology for establishing such limits or "benchmarks" for high cost loop support (HCLS).[3]

2. The Commission's benchmark rule responded to problematic incentives and inequitable distribution of support created by the prior rules. Under the prior rules, some carriers with high costs may have had up to 100 percent of their expenditures on loop costs reimbursed from the federal universal service fund. Because, prior to the *USF/ICC Transformation Order*, these carriers generally faced no overall limits on their expenditures, our rules gave carriers incentives to increase loop costs with little regard to efficiency or the burden on the Fund, and without regard to whether a lesser amount would be sufficient to provide supported services to their customers. Moreover, because HCLS overall is capped, carriers that did take measures to reduce costs to operate more efficiently lost support to their peers that increased costs.

[1] *See Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing a Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up; Universal Service Reform—Mobility Fund*; WC Docket Nos. 10-90, 07-135, 05-337, 03-109, CC Docket Nos. 01-92, 96-45, GN Docket No. 09-51, WT Docket No. 10-208, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC 17663 (2011) (*USF/ICC Transformation Order and FNPRM*); *pets. for review pending sub nom. In re: FCC 11-161*, No. 11-9900 (10th Cir. filed Dec. 8, 2011).

[2] *Id*. at 17741-47, paras. 210-26.

[3] Specifically, the methodology implements the Commission's rule, adopted in the *USF/ICC Transformation Order*, to limit reimbursable capital and operating costs for purposes of determining HCLS by using benchmarks for reasonable costs among similarly situated rate-of-return carriers. *See id*. at 17745, para. 220.

3. The benchmarking rule adopted by the Commission addresses these problems by, for the first time, placing reasonable overall limits on costs eligible for reimbursement through HCLS and redistributing freed-up HCLS to carriers that stay within these limits to allow for new broadband investment.[4] The Commission sought comment on a specific methodology to limit reimbursable capital and operating costs within HCLS and directed the Wireline Competition Bureau (Bureau) to finalize a methodology after receiving public input in response to the proposal.[5]

4. The methodology we adopt today, which is described in more detail in the attached technical appendix,[6] builds on the analysis proposed in the *USF/ICC Transformation FNPRM*,[7] but also includes several changes in response to the comments from two peer reviewers and interested parties and based on further analysis by the Bureau.[8] These changes significantly improve the methodology while redistributing funding to a greater number of carriers to support continued broadband investment. We now estimate that support to approximately 100 study areas with very high costs relative to similarly situated peers will be limited, while approximately 500 study areas will receive additional, redistributed support to fund new broadband investment.[9]

5. In view of the Commission's intent to "phase in reform with measured but certain transitions,"[10] we will phase in the application of these limits. As directed by the Commission, we are providing public notice in Appendix B of this order regarding the updated company-specific capped values that will be used in the HCLS formula. These capped values (which we also refer to as limits or benchmarks) will be used from July 1, 2012 through December 31, 2012,[11] in place of an individual company's actual cost data for those rate-of-return cost companies whose costs exceed the caps.[12] While the HCLS benchmarks will be implemented beginning July 1, 2012, we will not reduce support amounts immediately by the full amount as calculated using the benchmarks. Instead, we will reduce support commencing in July 2012 by twenty-five percent of the difference between the support calculated using the study area's reported cost per loop and the support as limited by the benchmarks, unless that reduction would exceed ten percent of the study area's support as otherwise would be calculated based on NECA cost data, absent implementation of this rule. Beginning January 1, 2013, we will reduce support by fifty percent of the difference between the support calculated using the study area's reported cost per loop and the support as limited by the benchmarks in effect for 2013. Beginning January 1, 2014, when we expect to have updated wire center boundaries, as discussed below, we will update the regressions (the

[4] *Id*.

[5] *See id*. at 17743-47, paras. 214-26, 18059-62, paras. 1079-88, 18285-94, App. H.

[6] *See infra* Appendix A.

[7] *See USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 18059-62, paras. 1079-88, 18285-94, App. H.

[8] *See* Letter from Patrick Halley, FCC, to Marlene Dortch, FCC, WC Docket Nos. 10-90, 07-135, 05-337, GN Docket No. 09-51, CC Docket Nos. 01-92, 96-45, 03-109, at Apps. B & C (filed Mar. 9, 2012) (Sanyal Peer Review and Waldon Peer Review, respectively).

[9] Based on the methodology proposed in the *USF/ICC Transformation Order and FNPRM*, the Commission estimated that support to 280 rate-of-return cost study areas would be reduced and that 340 rate-of-return cost study areas would receive additional support. *USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 18061, para. 1084.

[10] *Id.* at 17671, para. 11.

[11] *See infra* section III.G for a detailed discussion of how the transition will be implemented.

[12] *USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 17744, para. 218. Although the methodology determines capped values only for rate-of-return cost companies, the Commission directed the National Exchange Carrier Association (NECA) to modify the HCLS formula for average schedule companies to reflect the caps derived from the cost company data. *See infra* para. 10 and note 28.

coefficients), and support will be limited, in full, by the benchmarks in effect for 2014.[13] When fully implemented, we estimate that the roughly 100 study areas that are capped would see approximately $65 million in support reductions, while the roughly 500 study areas that are not capped would receive approximately $55 million in additional support for broadband investment.

II. BACKGROUND

6. In the *USF/ICC Transformation Order*, the Commission adopted a framework to establish reasonable limits on recovery of capital costs and operating expenses to improve the incentives for rate-of-return carriers to invest prudently and operate efficiently.[14] The Commission explained that "under our [previous] rules, a company receives support when its costs are relatively high compared to a national average – without regard to whether a lesser amount would be sufficient to provide supported services to its customers. The [previous] rules fail to create incentives to reduce expenditures; indeed, because of the operation of the overall cap on HCLS, carriers that take prudent measures to cut cost under our [previous] rules may actually lose HCLS support [sic] to carriers that significantly increase their costs in a given year."[15]

7. The Commission's new rule places "limits on the HCLS provided to carriers whose costs are significantly higher than other companies that are similarly situated" and provides that "support will be redistributed to those carriers whose unseparated loop cost is not limited by operation of the benchmark methodology."[16] The Commission found that its "new rule will discourage companies from over-spending relative to their peers" and "provide additional support to those companies that are otherwise at risk of losing HCLS altogether, and would not otherwise be well-positioned to further advance broadband deployment."[17]

8. The Commission set forth the parameters of the methodology the Bureau must use to limit payments from HCLS.[18] The Commission required the Bureau to compare companies' costs to those of similarly situated companies; concluded that statistical techniques should be used to determine which companies shall be deemed similarly situated; provided a non-exhaustive list of variables that the Bureau may consider for purposes of this analysis;[19] granted the Bureau discretion to determine whether other variables, such as soil type, would improve the regression analysis; and sought comment in the *USF/ICC Transformation FNPRM* on sources of publicly available soil data.[20] The Commission delegated to the Bureau the authority to adopt and implement a methodology within these parameters and

[13] The Commission directed the Bureau annually to update the regressions. *See USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 17744, para. 218. NECA, OPASTCO, and WTA sought reconsideration on this point. Petition for Reconsideration and Clarification of the National Exchange Carrier Association, Inc.; Organization for the Promotion and Advancement of Small Telecommunications Companies; and Western Telecommunications Alliance, WC Docket No. 10-90, et al., at 10 (filed Dec. 29, 2011). This issue, and other arguments raised in petitions for reconsideration of the requirements adopted in the *USF/ICC Transformation Order and FNPRM*, will be addressed at a future date by the full Commission.

[14] *See USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 17744-45, para. 219.

[15] *Id*.

[16] *Id*. at 17745, para. 220.

[17] *Id*.

[18] *See id*. at 17744, para. 217.

[19] *See id*. The variables identified by the Commission were: number of loops, number of housing units (broken out by whether the housing units are in urbanized areas, urbanized clusters, and nonurban areas), as well as geographic measures such as land area, water area, and the number of census blocks (all broken out by urbanized areas, urbanized clusters, and nonurban areas).

[20] *See id*. at 17744, para. 217, 18060, para. 1083.

to update the methodology as the Bureau gains more experience and additional information.[21]

9. The methodology proposed in Appendix H to the *USF/ICC Transformation FNPRM* used quantile regression analyses, NECA cost data, and 2010 Census data to generate a set of limits for each rate-of-return cost company study area.[22] The proposal would have limited the values used in eleven of the twenty-six steps in NECA's Cost Company Loop Cost Algorithm, which is used to calculate the study area's total unseparated cost per loop, and ultimately its HCLS. The proposed regression-derived limits were set at the 90th percentile of costs for each of the eleven algorithm steps, compared to similarly situated companies for each individual step. A company whose actual costs for a particular algorithm step are above the 90th percentile would be limited to recovering amounts that correspond to the 90th percentile of cost; i.e., the lesser of the company's capped algorithm value and the actual value would be inserted into the appropriate algorithm step for purposes of calculating the cost per loop used to determine HCLS. The Commission sought comment on whether the 90th percentile is the appropriate dividing line to disallow recovery of cost, or whether a lower or higher threshold, such as the 85th percentile or the 95th percentile, would be more appropriate.[23]

III. DISCUSSION

10. In this order, we implement the Commission's rule to use benchmarks to impose reasonable limits on reimbursable capital and operating costs for rate-of-return carriers for purposes of determining HCLS and adopt the methodology that the Bureau will use to determine carrier-specific benchmarks for rate-of-return cost companies. Consistent with parameters set forth by the Commission, we compare companies' costs to those of similarly situated companies using statistical techniques to determine which companies shall be deemed similarly situated.[24] As described in more detail in the attached technical appendix, we use NECA cost data and quantile regression analyses to generate a capital expense (capex) limit and an operating expense (opex) limit for each rate-of-return cost company study area.[25] The regression-derived limits are set at the 90th percentile of costs for capex and opex compared to

[21] *See id*. at 17744, para. 217.

[22] *See id*. at 18059-60, para. 1080-82, 18285-94, App. H. Although the Commission found that quantile regression is an appropriate technique to use in setting benchmarks for reimbursable investment and expenses, it invited further comment on alternative statistical techniques. *Id*. at 18060, para. 1082.

[23] *See id*. at 18059-60, para. 1080.

[24] These statistical techniques rely on a set of independent variables that control for a company's costs based on its situation, such as the population density and soil type of the area it serves. Section III.C below describes the full set of independent variables we are adopting, which is expanded from the proposal in the *USF/ICC Transformation Order and FNPRM* in response to the record we received.

[25] *See* National Exchange Carrier Assoc., Inc., Universal Service Fund Data, NECA's Study Results, 2010 Report (NECA 2010 USF Data), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf11r10.zip, *available at* http://transition.fcc.gov/wcb/iatd/neca.html. We use the NECA data because the Commission determined that the benefits of using data it already collects on a regular basis outweigh any advantages of an alternative approach. *See USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 17746, para. 224.

When the Commission proposed to establish benchmarks for reimbursable capital and operating costs in February 2011, its proposal was "based significantly on analysis submitted by the Nebraska Rural Independent Companies." *Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing a Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up*; WC Docket Nos. 10-90, 07-135, 05-337, 03-109, CC Docket Nos. 01-92, 96-45, GN Docket No. 09-51, Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking, 26 FCC Rcd 4554, 4624, para. 201 (2011) (footnote omitted) (*USF/ICC Transformation NRPM/FNPRM*). NRIC had submitted an analysis of capital expenditures and subsequently submitted an analysis of operating expenses.

similarly situated companies.[26] The capped values will be used in NECA's loop cost algorithm in place of an individual company's actual cost data for those rate-of-return cost companies whose costs exceed the caps, which will result in reduced support amounts for these carriers.[27] As directed by the Commission, NECA will modify the HCLS formula for average schedule companies to reflect the caps derived from the cost company data.[28] After application of the benchmark methodology, HCLS will be recalculated to account for the additional support available under the overall cap on total HCLS. Additional support will be redistributed to carriers whose loop cost is not limited by the benchmark methodology, and those carriers are required to use the additional support to preserve and advance the availability of modern networks capable of delivering broadband and voice telephony service.[29]

11. The methodology that we adopt builds on the proposed methodology in Appendix H of the *USF/ICC Transformation Order and FNPRM*,[30] but includes some significant improvements based on the many useful comments and ex parte presentations in this proceeding, the comments of two peer reviewers, and further analysis by the Bureau. As in the proposed methodology, we use quantile regression analysis and NECA cost data to generate a set of limits for each rate-of-return cost company study area and use the regression-derived limits in NECA's formula for calculating loop cost. We modify the proposal, however, by reducing the overall number of regressions from eleven to two: one for capital expenditures and one for operating expenditures. In addition, Commission staff examined and tested additional independent variables that were available from publicly available data sources, placed additional data sources in the record, and updated the methodology to reflect this further analysis. Below, and in the attached technical appendix, we explain these changes to the proposed methodology and respond to other significant issues raised in the record.

[26] Specifically, the 90th percentile of costs compared to similarly situated peers means that, based on data from all the carriers in the analysis, if there were 100 study areas with independent variable values, as adopted in section III.C below, that were the same as those for the study area in question, 90 of them would be expected to have capex and opex costs equal to or less than the 90th percentile prediction.

[27] NECA's HCLS formula, i.e., the 26-step Cost Company Loop Cost Algorithm, is available at http://transition.fcc.gov/wcb/iatd/neca.html. *See* National Exchange Carrier Assoc., Inc., NECA's Overview of Universal Service Fund, Submission of 2010 Study Results, App. B (filed Sept. 30, 2011) (NECA 2010 USF Overview), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf11af.zip.

[28] *USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 17744, para. 218. Specifically, we direct NECA to file proposed modifications to the average schedule formula within 30 days of the release of this order.

[29] Beginning January 1, 2014, carriers unaffected by the benchmark limits will receive additional redistributed support as calculated using a lower adjusted national average cost per loop (NACPL). The lower NACPL will be the NACPL that would be used if total reduced support, as a result of the application of the benchmark methodology, is redistributed to all carriers. Support to carriers affected by the benchmark will be calculated using the NACPL established pursuant to section 36.622 of the Commission's rules. 47 C.F.R. § 36.622. During the transition periods July 1, 2012 to December 31, 2012 and January 1, 2013 to December 31, 2013, the total amount of HCLS available to study areas not affected by the benchmark methodology will be the capped HCLS, as calculated pursuant to section 36.603(a) of the Commission's rules, less the total amount to be paid to study areas affected by the benchmark methodology during the transition periods. HCLS paid to the study areas not affected by the benchmark methodology will be calculated using an adjusted NACPL to produce the capped support pursuant to section 36.603(a) of the Commission's rules. 47 C.F.R. § 36.603(a). *See infra* section III.G.

We direct NECA to provide to the Bureau a recalculated NACPL for redistribution and a schedule of HCLS for all carriers for the six-month period of July 1, 2012 to December 31, 2012 within 30 days of the release of this order. Consistent with current practice, the filing NECA makes each October with the Commission shall include NACPL information and the schedule of HCLS for all carriers for the next year.

[30] *USF/ICC Transformation Order and FNPRM*, 26 FCC at 18059-62, paras. 1079-88, 18285-94, App. H.

A. Number of Regressions

12. The most significant change in methodology is that this analysis generates two caps for each company – a capex limit and an opex limit. The methodology proposed in the *FNPRM* generated eleven different caps for each company that would have limited the values in eleven of the twenty-six steps in NECA's loop cost algorithm. Based on our review of the record and further analysis, we conclude that a better approach is to divide a company's total cost in step twenty-five of the algorithm into its capex and opex components and use two regressions instead of using eleven independent regressions.

13. Commenters took differing views on the appropriate number of regressions. Commenters supporting more aggregation argue that limiting total cost, or separately limiting capital and operating expenses, is a better approach and suggest we use a single regression equation, or at most two equations.[31] One peer reviewer also recommended this approach.[32] Conversely, some commenters argued that the proposed eleven limits would not have allowed the algorithm to calculate support as it was intended,[33] and proposed that costs be further disaggregated to the underlying cost elements, i.e., "data lines," that make up each algorithm step.[34]

14. The choice of how many cost limits to adopt reflects a balancing of considerations. Using a greater number of regressions makes it possible to identify outliers at a granular level, but fails to

[31] *See, e.g.*, National Association of State Utility Consumer Advocates (NASUCA) et al. Comments, WC Docket No. 10-90 et al., at 52 (filed Jan. 18, 2012) (NASUCA et al. Comments) ("To avoid the issue of adopting an uneconomical set of inputs, the Commission could estimate only one equation, a total cost equation."); National Exchange Carrier Association et al. Comments, WC Docket No. 10-90 et al., at App. E, 1 (filed Jan. 18, 2012) (Roger Koenker, "Assessment of Quantile Regression Methods for Estimation of Reimbursable Cost Limits") (Rural Association Comments) ("A preferable, and simpler, approach would be to develop one conditional quantile model for aggregate costs."); Nebraska Rural Independent Companies (NRIC) Comments, WC Docket No. 10-90 et al., at 58 (filed Jan. 18, 2012) (NRIC Comments) ("Consolidating the 11 caps into two caps will also improve the reliability of the associated regression studies."); NRIC Reply Comments, WC Docket No. 10-90 et al., at 6 (filed Feb. 17, 2012) (NRIC Reply Comments) (agreeing with Koenker that "a single cost cap can work as well as or better than the two caps NRIC originally suggested"); Carriers for Progress in Rural America Reply Comments, WC Docket No. 10-90 et al., at 12 (filed Feb. 17, 2012) (proposing "that the Commission's model be redesigned to maximize carriers' overall efficiency," [which] "could be accomplished by reducing the eleven cost categories to just two categories: a limit on capex and a limit on opex.").

[32] Sanyal Peer Review at 1 ("By disaggregating the total cost function, and estimating the cost lines separately using quantile regression, and then adding them up, assumes that the quantile of the sums equals the sum of the quantiles. An argument that is similar to the sum of means of a random variable being equal to the mean of the sum. However, this relationship does not hold true for quantile regressions.").

[33] *See, e.g.*, Moss Adams et al. Comments, WC Docket No. 10-90 et al., at 16 (filed Jan. 18, 2012) (Moss Adams et al. Comments) (arguing that the proposed methodology does not allow NECA's formula for calculating loop cost to calculate support as it was intended because the benchmarks limit algorithm steps in the formula rather than the data lines); Chillicothe Telephone Company Comments, WC Docket No. 10-90 et al., at 7 (filed Jan. 18, 2012) (Chillicothe Comments); Central Texas Comments, WC Docket No. 10-90 et al., at 8- 9, 10 (filed Jan. 18, 2012) (Central Texas Comments). NECA collects cost data from rate-of-return cost companies and the data lines for investments and expenses generally correspond to specific Part 32 accounts or subaccounts. *See* NECA 2010 USF Overview, http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf11af.zip, App. A (Universal Service Fund: 2011 Data Collection Instructions) *available at* http://transition.fcc.gov/wcb/iatd/neca.html.

[34] *See* Moss Adams et al. Comments at 16 (noting that "all of the algorithm lines are calculations based on various data lines, so any proposed limitations can also be accomplished by adjusting the data lines"). Although some parties recommend placing limits only on certain cost categories, *see, e.g.*, Accipiter Comments, WC Docket No. 10-90 et al., at 19 (filed Jan. 18, 2012) (Accipiter Comments), using data lines would inevitably increase the number of separate regressions.

account for the interrelationships within the cost categories that feed into the twenty-six step algorithm as identified in the record and in the peer review.[35] In contrast, using fewer regressions limits the Commission's ability to identify outliers, but enables carriers to account for the needs of individual networks and recognizes the fact that carriers may have higher costs in one category that may be offset by lower costs in others.[36]

15. Balancing these considerations, we conclude that it is appropriate to reduce the number of separate cost caps set from the proposed approach in Appendix H, but to retain separate limits for capex and opex. We are persuaded that limiting eleven separate cost categories could have the effect of overly limiting carriers' ability to optimize among spending tradeoffs. At the same time, an approach that only limited total cost would provide fewer safeguards against overspending. Capital and operating expenditures reflect fundamentally different measures of business performance. Using two regressions instead of one provides carriers flexibility to manage their operations, while still enabling the Commission to identify more instances where carriers spend markedly more in either category than their similarly-situated peers.

16. The approach we adopt is also supported by other considerations. In particular, the methodology we adopt simplifies the process of fitting the benchmark computation within the structure of NECA's loop cost algorithm.[37] Instead of potentially limiting values in eleven of the twenty-six steps, we only change the value for companies that exceed the caps in step twenty-five, total unseparated costs.[38] Although we divide the components of step twenty-five into capex and opex components for purposes of running two regressions and create separate capex and opex limits, the two components are added together for purposes of calculating total costs, study area cost per loop, and ultimately HCLS.[39]

B. Defining Capex and Opex

17. As discussed below and in more detail in the technical appendix, we define capex as the plant-related costs in step twenty-five, which include return on capital and depreciation, and define opex as the remaining components that are added in step twenty-five to calculate total costs.[40] These revised

[35] *See, e.g.*, NRIC Comments, at 12, 55-59; NASUCA et al. Comments at 50 (arguing that the unintended consequences of the proposed methodology would include "large payments to accountants to develop techniques that allow carriers to avoid the constraints and the incentive to adopt an uneconomical set of inputs"); Sanyal Peer Review at 2 ("[I]ndividual cost capping ignores any complementary or substitutability between the various cost components.").

[36] *See, e.g.*, Rural Association Comments at App. D, 14 ("By limiting each account separately, without regard to needs of individual networks, the Commission's method discourages network optimization."); NASUCA et al. Comments at 51 (arguing that under the proposed methodology "the carrier has an incentive to choose those inputs that allow it to remain under all of the caps, even though a different set of inputs would lead to a lower cost of service, because when the carriers adopts the lower total cost of service inputs it may exceed the cap related to just one of the inputs"); Accipiter Comments at 18 ("[T]he individual cost caps should consider the interplay between different cost categories to avoid penalizing a higher investment in one cost category to produce lower costs in another category."). Accipiter also argues that we should select fewer individual cost categories subject to limits and only limit cost categories where incentives to overspend may exist. *See* Accipiter Comments at 19.

[37] It is important that the methodology fit within this framework because the Commission modified the HCLS mechanism; it did not replace it with a new regime.

[38] Step twenty-five is the sum of steps thirteen through twenty-four.

[39] For companies whose actual capex and/or opex exceed the benchmarks, the capped values will be added in step twenty-five in place of an individual company's actual cost data. Capex components will be summed into step 25A and opex into step 25B; step 25C becomes the new total unseparated costs. *See* Appendix A at para. 6.

[40] As discussed in the technical appendix, for the dependent variables, the regressions use the natural log of the capex components and the natural log of the opex components. *See infra* Appendix A at paras. 11, 23.

definitions of capex and opex differ from those used in the proposed methodology in several important ways.

18. The most important revision to the capex definition is the treatment of depreciation in relationship to capital costs. To determine capex limits, the proposed methodology created separate caps for two categories of gross plant (cable and wire facilities, and central office equipment), and for the depreciation and amortization associated with those plant categories.[41] In the revised methodology, we define capex as the return on net plant and depreciation.[42] Many commenters pointed out that the proposed methodology did not properly account for accumulated depreciation and depreciation expense, and we agree.[43] We do not agree, however, with those who argue that depreciation expense should not be included in the regression analysis.[44] Although depreciation is termed an "expense" for regulatory accounting purposes, as the Rural Associations and several other commenters point out, depreciation expense is properly considered as a component of capital costs because it is directly related and calculated as a result of capital investment.[45] The proposed methodology would have limited gross plant, but did not adjust the accumulated depreciation or depreciation expense as would have been necessary when gross plant was limited by the benchmark. The method we now adopt includes net plant rather than gross plant, so we appropriately account for accumulated depreciation.[46]

19. Our revised opex definition includes the remaining components that are summed in step 25 in the NECA algorithm to determine total unseparated costs.[47] The proposed methodology excluded three of these – corporate operations expense, operating taxes, and rents – which we now include in determining opex. In the *USF/ICC Transformation Order*, the Commission revised the formula for limiting recovery of corporate operations expenses for HCLS in section 36.621(a)(4) of the Commission's

[41] The proposed methodology created separate caps for steps 1, 2, 17 and 18 of the NECA algorithm. *See USF/ICC Transformation Order and FNPRM*, 26 FCC at 18288, App. H, para. 15.

[42] Capex includes the return component for cable and wire facilities category 1 (C&WF) (step 23); the return component for central office equipment category 4.13 (COE) (step 24); depreciation and amortization expense assigned to C&WF (step 17); and depreciation and amortization expense assigned to depreciation assigned to COE (step 18).

[43] *See, e.g.*, Moss Adams et al. Comments at 15-18; Rural Association Comments at 67-68, App. D at 9-11; Chillicothe Comments at 6-9; Central Texas Comments at 8- 9, 14-16.

[44] Some commenters argue that regression should not be used to limit depreciation expense, but suggest an alternative method of limiting depreciation. *See, e.g.*, Moss Adams et al. Comments at 18 (recommending that "regression not be used to limit depreciation expense," but arguing that "depreciation expense limitations should be computed as the percentage of the limitation of the associated plant investment multiplied by the depreciation expense"); Chillicothe Comments at 9; Central Texas Comments at 14; Guadalupe Valley Telephone Cooperative Comments, WC Docket No. 10-90 et al., at 5-6 (filed Jan. 18, 2012) (Guadalupe Valley Comments). Another commenter argues that there is no need to limit depreciation expense at all. *See* NRIC Comments at 59 ("Since depreciation rates are regulated, and investment itself is capped, there is no need to cap depreciation expense.").

[45] *See, e.g.*, Moss Adams et al. Comments at 18; Rural Associations Reply Comments, App. B at 3; Letter from Michael R. Romano, NTCA, to Marlene H. Dortch, FCC, WC Docket No. 10-90 et al., at 2 (dated March 23, 2012).

[46] Instead of creating separate caps for step 1 (C&WF) and step 2 (COE), the revised methodology includes the return on net plant steps 23 and 24 in the capex regression. The return component for CW&F is calculated in step 23 by adding CW&F in step 1 to CW&F materials and supplies in step 7, subtracting accumulated depreciation assigned to CW&F in step 9, and multiplying that value by the 11.25% authorized rate of return to determine the return component for C&WF. The return component for COE in step 24 is calculated in a similar manner. The revised methodology recognizes that materials and supplies are plant-related capital costs and a component of the return on capital in steps 23 and 24.

[47] Opex includes C&WF maintenance (step13), and COE maintenance (step 14); network expenses (steps 15 and 16); corporate operations expense (step 19); operating taxes (step 20); corporate benefits (step 21), and rents (step 22).

rules.[48] Because of this separate limitation, the proposed methodology did not create an additional limit for corporate operations expense. Now that we are analyzing all operating costs as a whole, it is appropriate to include corporate operations expense, as well as the other operating expenses, taxes and rents.[49] For purposes of this analysis, we will use either a carrier's actual corporate operations expense or the amount allowable under section 36.621(a)(4), whichever is less. By using the allowable amount, we avoid restricting carriers affected by section 36.621(a)(4) twice for their corporate operations expenses above that limitation.[50]

C. Selection of Independent Variables

20. The revised methodology also includes additional independent variables that were suggested by commenters and one of the peer reviewers, and eliminates some that had been included in the methodology proposed in the *USF/ICC Transformation FNPRM*, because we found the new variables to be better estimators of cost. In the *USF/ICC Transformation FNPRM*, the Commission noted that NRIC's Capital Expenditure Study included variables for frost index, wetlands percentage, soils texture, and road intersections frequency, and invited commenters advocating the inclusion of additional independent variables to identify the data source, completeness, and cost of the additional data, if not publicly available.[51] The Commission specifically sought comment on sources of soil data other than the Soil Survey Geographic Database (SSURGO) used in the NRIC study and how to deal with areas where the SSURGO data are missing or incomplete.[52] Many commenters suggest additional variables, and Bureau staff examined those for which data were available. The technical appendix describes in more detail the independent variables included in the methodology, those examined but excluded, and those that commenters suggested but that could not be included because the data were either unavailable to the Commission, nonpublic, or could not be generated at the study area level.[53] We briefly discuss the variables included in the revised methodology below.

21. The methodology uses cost-driving variables directly where available and proxies that are sufficiently correlated with cost drivers where necessary. For example, the number of loops is a direct measure of a study area's scale, and the number of road miles is a proxy for total loop length.[54] Because most cable follows roads, it is reasonable to believe that the number of road miles in a study area is a

[48] *See* 47 C.F.R. § 36.621(a)(4); *USF/ICC Transformation Order and FNPRM*, 26 FCC at 17747-49, paras. 227-33. The Commission also extended the corporate operations limitation to interstate common line support (ICLS). *Id.*

[49] For further discussion, *see* Appendix A at paras. 23, 26-28.

[50] Most study areas are not affected by the corporate operations expense limitation in section 36.621(a)(4). NRIC argues that, if there were a single cap on total costs, there would be no need to cap a single expense, if total costs remain reasonable. *See* NRIC Reply Comments at 7-8. As an alternative to eliminating the corporate operations expense limitation, NRIC recommends the approach we take here. *See* NRIC Reply Comments at 8 n.17. ("Alternatively, even if the Commission decided to retain some kind of separate corporate operations cap, it could still constrain factor AL19, which is corporate operations expense, and the result would flow through automatically into the overall cap calculation for AL26.").

[51] *See USF/ICC Transformation Order and FNPRM*, 26 FCC at 18060-61, para. 1083.

[52] *See id.*; U.S. Department of Agriculture, Natural Resources Conservation Service, Available Soil Survey Data (SSURGO) (2012), *available at* http://soildatamart.nrcs.usda.gov/ (last visited Apr. 24, 2012).

[53] As discussed in the technical appendix, the regressions use the natural logs of the independent variables except those that are dummy variables, a pure index, or a percentage. *See infra* Appendix A at para. 11.

[54] *See infra* Appendix A at para. 33. Several commenters argue that some measure of loop length is an important cost driver and suggest that some carriers already provide average loop lengths and other relevant data to the Rural Utilities Service (RUS). *See, e.g.*, Central Texas Comments at 6-7; Chillicothe Comments at 3-4; Accipiter at 26; Moss Adams et al. Comments at 11-12.

good proxy for the cabling required to serve that area.[55] Some commenters suggest that the age of plant is an important variable, and we agree.[56] Many carriers have recently replaced aging plant with modern communications networks capable of providing voice and broadband service, and those carriers are not similarly situated to carriers with plant that is more fully depreciated. Accordingly, while data on the average age of plant are not readily available, the revised methodology now includes a variable for the percentage of plant that has not yet been depreciated, which is highly correlated with plant age. The revised methodology also includes variables that account for customer dispersion: density (housing units divided by square miles); number of exchanges, which roughly accounts for the population centers in a study area; and portion of households in urbanized clusters or urbanized areas.[57]

22. In addition, the revised methodology includes several geographic independent variables that Bureau staff developed from various data sources. First, we agree with the many commenters who argue that the proposed methodology should include soils data.[58] Bureau staff used the U.S. General Soil Map (STATSGO2) soils database to construct two soil-based variables that are included in the revised methodology: depth of bedrock, and soils difficulty.[59] Although the SSURGO database contains a richer set of soil variables and data at a more granular level than STATSGO2, it does not provide data for the entire country. Some commenters argue that we should use the SSURGO data where available and STATSGO2 for the remaining study areas, but we decline to use an approach that treats study areas differently depending on the availability of the data.[60] In addition, NRIC's Capital Expenditure Study includes a frost index developed from the SSURGO data, but this information is not available for all areas in the STATSGO2 database. Several commenters discuss the need for such a frost index.[61] As a proxy for this information, Bureau staff developed a climate variable based on the average annual minimum temperature from the U.S. Department of Agriculture's hardiness index.[62]

23. We also agree with commenters who emphasized that carriers serving particular areas such as Alaska, Tribal lands, and national parks could face unique challenges. In particular, some

[55] Other proxies for scale used in the methodology are the number of road crossings and the number of commonly-owned study areas in a state. In its Capital Expenditure Study, NRIC predicted that road intersections would slow construction and impose other costs, and Bureau staff concludes this is another good proxy for scale. *See* NRIC Capital Expenditure Study at 10. In addition, Bureau staff expects that the number of commonly-owned study areas would be a good predictor of costs because some expenses could be shared among study areas. *See infra* Appendix at paras. 35, 37.

[56] *See, e.g.*, Accipiter Comments at 5-6, 33-34; Guadalupe Valley Comments at 3-4; Carriers for Progress in Rural America Comments, WC Docket No. 10-90 et al., at 6-7 (filed Jan. 18, 2012); *infra* Appendix A at para. 38.

[57] *See infra* Appendix A at para. 39-41.

[58] *See, e.g.*, NRIC Comments at 22-24; Moss Adams Comments et al. at 8; ATC Communications Comments, WC Docket No. 10-90 et al., at 3 (filed Jan. 18, 2012); Chillicothe Comments at 2; Northern Telephone Cooperative Comments, WC Docket No. 10-90 et al., at 3 (filed Jan. 18, 2012) (Northern Telephone Comments); Washington Independent Telecommunications Association et al. Comments, WC Docket No. 10-90 et al., at 4-5 (filed Jan. 17, 2012).

[59] *See* Appendix A at paras. 43,45; U.S. Department of Agriculture, Natural Resources Conservation Service, U.S. General Soil Map (STATSGO2) *available at* http://soils.usda.gov/survey/geography/statsgo (last visited Apr. 24, 2012).

[60] *See* NRIC Comments at 24; NASUCA et al. Comments at 46; *infra* Appendix at paras. 53-54.

[61] *See, e.g.*, Blooston Rural Broadband Carriers Comments, WC Docket No. 10-90 et al., at 2 (filed Jan. 18, 2012) (Blooston Comments); Interbel Comments, WC Docket No. 10-90 et al., at 10 (filed Jan. 18, 2012) (Interbel Comments); NRIC Comments at 25.

[62] *See infra* Appendix A at para. 47; *see also* U.S. Department of Agriculture, U.S. National Arboretum, Plant Hardiness Zone Map (2012), *available at* http://www.usna.usda.gov/Hardzone (last visited Apr. 24, 2012).

commenters suggest that it is more costly to provide service on Tribal lands;[63] the methodology now includes an additional independent variable for the percentage of each study area that is a federally-recognized Tribal land.[64] In addition, Alaskan commenters argued that Alaska is unique because of its harsh climate and other factors; accordingly, the methodology now includes a variable indicating whether or not the study area is in Alaska.[65] Some commenters also argued that it is more difficult to construct and maintain networks in national parks;[66] the methodology also now includes an additional independent variable for the percentage of each study area that lies within a national park.[67] NRIC's Operating Expenses Study found that operating expenses were correlated with regions, and Bureau staff tested variables for the four census-based regions: Western, Midwest, Northeast and South.[68] The revised methodology also includes the two that were significant: the Midwest and Northeast.

D. Use of Boundary Data

24. All geographic independent variables were rolled up to the study area using Tele Atlas wire center data, which is a widely-used commercially available comprehensive source for this information.[69] Several commenters question the accuracy of those boundaries.[70] For example, the Rural Associations point to a NECA study that concluded many of the Tele Atlas boundaries "differ quite significantly from actual boundaries."[71] In addition, some companies that argue that their boundaries, and in particular the resulting measure of square miles in their service territories, were inaccurate in the proposed methodology have asked how they could correct errors in the data.[72]

25. The only comprehensive set of wire center boundaries are those commercially available from companies such as Tele Atlas and GeoResults. There is precedent for using Tele Atlas' (or a

[63] *See, e.g.*, Gila River Telecommunications Comments, WC Docket No. 10-90 et al. (filed Jan. 18, 2012); Hopi Telecommunications Comments, WC Docket No. 10-90 et al. (filed Jan. 18, 2012); Mescalero Apache Telecom Comments, WC Docket No. 10-90 et al. (filed Jan. 18, 2012); National Tribal Telecommunications Association Comments, WC Docket No. 10-90 et al. (filed Jan. 18, 2012); Sacred Wind Comments, WC Docket No. 10-90 et al. (filed Jan. 17, 2012); Alexicon Telecommunications Consulting Comments, WC Docket No. 10-90 et al., at 18-19, App. B (filed Jan. 18, 2012) (Alexicon Comments).

[64] *See infra* Appendix at para. 49-50.

[65] *See, e.g.*, Alaska Rural Coalition Comments, WC Docket No. 10-90 et al., at 17-19 (filed Jan. 18, 2012); Copper Valley Telephone Cooperative Comments, WC Docket No. 10-90 et al., at 5-7 (filed Jan. 17, 2012).

[66] *See, e.g.*, Interbel Comments at 3.

[67] *See infra* Appendix at para. 49-50. In the future, if sufficient data become available, we may consider including a variable that would account for all federal lands (i.e., that is not limited to national park lands).

[68] *See* NRIC Operating Expense Study at 8; *infra* Appendix at para. 52.

[69] TomTom Telecommunications Suite 2011.09 (formerly Tele Atlas North America), Wire Center Premium, for wire center boundary and central office location information. Earlier study area boundary versions were also used to exclude the portions of study areas that were associated with frozen support.

[70] *See, e.g.*, Calaveras Telephone Comments, WC Docket No. 10-90 et al., at 6-7(filed Jan. 18, 2012); Eagle Telephone Comments, WC Docket No. 10-90 et al., at 3 (filed Jan. 18, 2012); Moss Adams et al. Comments at 10; Northern Telephone Comments at 2-3; NRIC Comments at 2-29.

[71] Rural Association Comments, Appendix D at 3-4. ("Of 357 study areas for which NECA has actual boundaries, 144 are not accurate within 5%, and 80 are not even accurate within 20%. A significant number differ by more than 50%, and a few are completely (i.e., 100%) inaccurate."). *Id. See also* Joint Comments of NECA, NTCA, OPASTCO, WTA, and the Rural Alliance, WC Docket No. 10-90 et al., at Attach. at 1-3 (filed July 12, 2010) (NECA et al. July 12, 2010 Comments).

[72] *See, e.g.*, Letter from Joshua Seidemann, NTCA, to Marlene Dortch, FCC, WC Docket No. 10-90 et al. (filed Mar. 21, 2012).

predecessor company's) boundaries. In particular, the Commission's hybrid cost proxy model uses a customer location data set that was created using an earlier version of the Tele Atlas boundaries.[73]

26. We decline to adopt NRIC's proposal that we modify study area boundaries before implementing the regression methodology based on publicly available state maps.[74] While many states have study area maps available on-line,[75] the vast majority of those maps will not allow Commission staff to calculate the information required for the analysis we adopt. Variables like road miles and those related to local soil conditions require having GIS-based boundaries that can be overlaid with other GIS-based data sets (like road networks and databases of soil conditions). It is not practical to derive such information from printed maps, images on websites or PDF files with any accuracy. In addition, it is not clear whether state maps represent authoritative boundaries. Therefore, we do not believe that the proposal by NRIC is a practical means to derive more reliable study area boundary information quickly.[76]

27. Nevertheless, we recognize concerns remain regarding inaccuracies in this data set, and we adopt a two-part process to address these concerns. First, in the near term, we will provide a streamlined, expedited waiver process for carriers affected by the benchmarks to correct any errors in their study area boundaries. Second, to correct any remaining inaccuracies in the Tele Atlas data set, we will issue a Public Notice to initiate the process of collecting study area boundaries directly from all rate-of-return carriers. The Public Notice will seek comment on data specifications for a data request that the Bureau would issue after receiving input from the public and interested parties. We expect that we will have updated boundary data before we rerun the regression to calculate capex and opex limits that will be used for calculating support for 2014, at which time the limits will apply in full.[77]

28. In light of the protections we adopt to address errors in the TeleAtlas data, we decline to delay implementation of the benchmarks beyond the 18-month phase-in described below. The Commission anticipated that "HCLS benchmarks will be implemented for support calculations beginning July 2012."[78] In many cases, more accurate boundaries would not change whether or not a particular company is capped or not by the benchmark methodology. And the streamlined, expedited waiver

[73] Business Location Research was subsequently acquired by Geographic Data Technology, which was acquired by Tele Atlas. *See 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, Tenth Report and Order, 14 FCC Rcd 20156, 20181, para. 51 (1999) (*Tenth Report and Order*), affirmed, *Qwest Corp. v. FCC*, 258 F.3d 1191 (10th Cir. 2001) (*Qwest I*). The Commission has also used the TeleAtlas boundaries to create maps of study areas receiving the highest per-line support amounts and the states with the most competitive eligible telecommunications carriers in response to requests from the U.S. House of Representatives, Committee on Energy and Commerce. *See, e.g.*, FCC Responses to Requests 5 and 7 (July 27, 2011), *available at* http://democrats.energycommerce.house.gov/index.php?q=news/bipartisan-energy-and-commerce-leaders-release-information-on-universal-service-fund.

[74] *See* Letter from Cheryl L. Parrino, Parrino Strategic Consulting Group, to Marlene H. Dortch, FCC, WC Docket No. 10-90 et al., Attach. A, at 4 (filed Apr. 13, 2012).

[75] *See id.*, Attach. B.

[76] The Rural Associations acknowledge that compiling a new dataset of study area boundaries will require substantial effort because "[v]erifiable studies of documented serving areas of all RLECs would need to be completed to assure that calculations are correct. These studies would involve obtaining maps of study area boundaries for each RLEC, which would need to be digitized to create a workable database of actual study area boundaries." Rural Association Comments, App. D at 4.

[77] We emphasize that because we phase in the benchmarks, companies will experience no more than half of the reduction otherwise required by the benchmarks until we have updated boundary data. Phasing in the application of the limits over 18 months helps address concerns about the accuracy of the existing boundary data in the interim period before the limits apply in full.

[78] *USF/ICC Transformation Order and FNPRM*, 26 FCC at 17744, para 216.

process we adopt to correct boundaries in the near-term will address those specific instances where an inaccurate boundary could result in a company losing more support than it would otherwise.[79]

29. Specifically, any carrier whose actual boundaries are different from the boundaries used by the Bureau in the methodology we adopt today may file a petition for waiver in accordance with section 1.3 of the Commission's rules.[80] To enable the Bureau to determine whether there are special circumstances (i.e., inaccurate boundaries) supporting a waiver, petitioners must provide accurate boundary information in a manner and format that Bureau staff can readily evaluate and process.[81] In Appendix C, the Bureau sets forth a template for filing study area maps to help potential petitioners file information efficiently, accurately, and in a manner that will permit the Bureau to evaluate and process the information expeditiously.

30. While potential petitioners may choose to submit boundary information in other formats, the Bureau cautions that information submitted in other formats may require additional processing, and that the processing could introduce errors and/or delay. For example, if petitioners file hard copy maps, those would need to be rectified (stretched) to have a spatial reference, and digitized by Bureau staff. Accordingly, petitioners that do not wish to use the Bureau's template may wish to consult with Bureau staff in advance of filing boundary information in alternate formats to ensure that the information submitted can be processed quickly.

31. Regardless of how the boundary information is filed, an officer of the company must certify under penalty of perjury that the information provided is accurate. We also emphasize that carriers using this waiver process solely to seek changes to their study area boundaries used in the benchmark methodology are not required to file the financial data and other information required for waivers as set forth in the *USF/ICC Transformation Order*.[82] The financial data and other information set forth in the *USF/ICC Transformation Order* is relevant for petitions for waiver alleging that "reductions in current support levels would threaten [a carrier's] financial viability, imperiling service to consumers in the areas they serve."[83] In contrast, when considering whether there are special circumstances and the public interest is served by granting a waiver of the benchmark methodology, we will be focusing on ensuring that accurate data is used to perform the necessary computations, regardless of the extent of support reduction. In addition, carriers using this streamlined, expedited waiver process to make technical corrections to their study area boundaries need not pay the filing fee associated with requests for waiver of Part 36 separations rules.[84] With the safeguard provided by this streamlined, expedited waiver process, we conclude it is appropriate to use the Tele Atlas boundaries on an interim basis.

[79] Consistent with existing practice, if such a waiver request is granted and a true-up is required, a carrier's support amounts will be trued-up back to July 1, 2012.

[80] Generally, the Commission's rules may be waived if good cause is shown. 47 C.F.R. § 1.3. The Commission may exercise its discretion to waive a rule where the particular facts make strict compliance inconsistent with the public interest. *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990) (*Northeast Cellular*). In addition, the Commission may take into account considerations of hardship, equity, or more effective implementation of overall policy on an individual basis. *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969); *Northeast Cellular*, 897 F.2d at 1166. Waiver of the Commission's rules is appropriate only if both (i) special circumstances warrant a deviation from the general rule, and (ii) such deviation will serve the public interest. *NetworkIP, LLC v. FCC*, 548 F.3d 116, 125-128 (D.C. Cir. 2008); *Northeast Cellular*, 897 F.2d at 1166.

[81] *See infra* Appendix C.

[82] *USF/ICC Transformation Order and FNPRM*, 26 FCC at 17839-42, paras. 539-44.

[83] *Id.* at 17839, para. 539.

[84] *See* 47 C.F.R. § 1.1105.

E. Use of Quantile Regression and the 90th Percentile Cost Threshold

32. As discussed in the technical appendix, we conclude that quantile regression analysis is the appropriate methodology to use to identify study areas that have capex and opex costs that are much higher than those of their similarly situated peers and to cap their cost recovery at amounts that are no higher than the vast majority of similarly situated study areas.[85] We also conclude that we should set the regression-derived limits at the 90th percentile of costs for capex and opex compared to similarly situated companies.

33. Some commenters criticized the use of the 90th percentile, arguing that it was unreasonable because approximately forty percent of study areas in the methodology proposed in the *FNPRM* would have been subject to limits in one or more of the eleven cost categories used in that analysis.[86] On further consideration, we have concluded that the proposed methodology was over-inclusive because a carrier that exceeded the cap in only one category, but had costs well below the caps in the other ten, would have received reduced support. As discussed above, however, we are adopting a revised methodology that relies on aggregated capex and opex caps. Applying the revised methodology with a 90th percentile cap limits reimbursable costs for only fifteen percent of the study areas of cost companies. The net effect is fewer study areas will see reduced support, and more companies will see additional support, due to the distribution of support among HCLS recipients.

34. Accordingly, we do not agree with commenters who argue that we should limit at most those carriers with costs above the 95th percentile.[87] Indeed, we note that using the 90th percentile with the modifications adopted today leads to approximately the same number of study areas with capped costs as would have been the case if we were to use the 95th percentile with the Appendix H methodology.[88] We conclude that using the 90th percentile as part of the revised methodology appropriately balances the Commission's twin goals of providing better incentives for carriers to invest prudently and operate more efficiently, and providing additional support to further advance broadband deployment. By providing additional, redistributed HCLS to carriers that do not have the highest costs among similarly situated companies, our budget for high-cost support should enable more broadband deployment than if we continued funding more of the highest cost companies at current levels.

35. In view of the fact that many carriers will receive additional, redistributed HCLS, we take this opportunity to emphasize the obligations that attach to the additional funding. Section 254(e) of the Act requires that this additional funding – like all federal universal service support – be used "only for the provision, maintenance, and upgrading of facilities and services for which the support is intended."[89] Consistent with the *USF/ICC Transformation Order*, the overarching intent is to preserve and advance the availability of modern networks capable of delivering broadband and voice telephony service.[90] Indeed, all rate-of-return carriers are required to provide broadband upon reasonable request beginning July 1, 2012, as a condition of receiving federal high-cost universal service support.[91] Carriers must use their high-cost universal service support – including any additional funding – in compliance with these

[85] *See infra* Appendix A at paras. 7-10.

[86] *See, e.g.*, Blooston Comments at 4; Rural Association Comments at 71

[87] *See, e.g.*, Alexicon Comments at 14-15; NASUCA et al. at 53; NRIC Comments at 51-53.

[88] Using the methodology proposed in Appendix H of the *USF/ICC Transformation Order and FNPRM* and the 95th percentile would have limited reimbursable costs for approximately fifteen percent of the study areas – no different than selecting the 90th percentile with the other improvements we adopt today.

[89] 47 U.S.C. § 254(e).

[90] *See USF/ICC Transformation Order*, 26 FCC Rcd at 17670, para. 11, 17681, para. 51, para. 17854, para. 587.

[91] *See id.* at 17740, para. 206.

requirements.

36. We further note that all rate-of-return carriers will be required to file a new build-out plan, which accounts for the new broadband obligations, in 2013.[92] Those plans must be updated annually to reflect progress on network improvements and build-out, which should reflect the impact of high-cost universal service support, including any additional funding.[93] The Commission will be reviewing those plans and updates, as well as other information provided in the annual section 54.313 reports, to ensure that carriers are complying with their public interest obligations, including their build-out requirements. Further, the progress report on those plans will be part of the factual basis that supports the annual section 54.314 certification by the states or carriers that support is being used for the intended purposes.[94]

F. Other Issues

37. *Retroactivity*. We disagree with commenters who assert that applying the benchmarks to limit HCLS payments constitutes retroactive rulemaking.[95] A rule does not operate retroactively merely because it is "applied in a case arising from conduct antedating [its] enactment" or "upsets expectations based on prior law."[96] Rather, a rule operates retroactively if it "takes away or impairs vested rights acquired under existing law, or creates a new obligation, imposes a new duty, or attaches a new disability in respect to transactions or considerations already past."[97]

38. Here, it cannot fairly be said that the application of these benchmarks will take away or impair a vested right, create a new obligation, impose a new duty, or attach a new disability in respect to the carriers' previous expenditures. There is no statutory provision or Commission rule that provides companies with a vested right to continue to receive support at particular levels or through the use of a particular methodology.[98] Although application of the benchmarks may affect the amount of support a carrier receives for expenditures made in 2010 (or before),[99] it does not change the legal landscape in

[92] *See id.* at 17854, para. 587.

[93] *See id.*

[94] *See id.* at 17859-61 paras. 607-612.

[95] *See, e.g.*, GVNW Consulting Comments, WC Docket No. 10-90 et al., at 11-12 (filed Jan. 17, 2012) ("the Commission's proposal to adopt regression caps is unlawful and constitutes retroactive rulemaking"); Alexicon Comments at 12-14 ("this result is substantially similar to retroactive ratemaking"); Blooston Comments at 3-5 ("retroactive application of the [quantile regression analysis] . . . contravenes well-settled principle [sic] of agency law and precedent").

[96] *Landgraf v. USI Film Products*, 511 U.S. 244, 269-70 (1994).

[97] *Marrie v. SEC*, 374 F.3d 1196, 1207 (D.C. Cir. 2004) (quotation omitted); *see also Blanco de Belbruno v. Ashcroft*, 362 F.3d 272, 283 (4th Cir. 2004) ("to determine whether a regulatory change has retroactive effect, we must determine that a rule 'attaches new legal consequences to events completed before its enactment'") (quoting *INS v. St. Cyr*, 533 U.S. 289, 321 (2001)).

[98] *See USF/ICC Transformation Order*, 26 FCC Rcd at 17770-71, para. 293; 47 U.S.C. § 254; *see also Rural Cellular Association v. FCC*, 588 F.3d 1095, 1103 (D.C. Cir. 2009) ("[the] purpose of universal service is to benefit the customer, not the carrier") (quotation omitted). We note that the Commission has been seeking comment on whether and how to change the support methodology for rural carriers since 2004, which should have made it evident to those carriers that they are not guaranteed a particular level of support. *See Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Order, 19 FCC Rcd 11538 (2004). Indeed, the Commission's proposals to reform support for rural carriers have ranged from the modest, targeted reforms adopted in the *USF/ICC Transformation Order* to more sweeping proposals to auction all high-cost support. *See, e.g., Federal-State Joint Board on Universal Service*, WC Docket No. 05-337, CC Docket No. 96-45, Notice of Proposed Rulemaking, 23 FCC Rcd 2495 (2008).

[99] *See supra* note 25.

which those expenditures were made. Rather, as the Commission observed in the *USF/ICC Transformation Order*, "section 254 directs the Commission to provide support that is sufficient to achieve universal service goals, [but] that obligation does not create any entitlement or expectation that ETCs will receive any particular level of support or even any support at all."[100]

39. Indeed, consistent with the Commission's focus on service to consumers, the Commission declined to provide any group of companies with a blanket exception from universal service reforms for past investments, recognizing that the current rules were not efficiently serving universal service goals. Providing such exceptions would have made it impossible to reform the system over any reasonable time period. Instead, the Commission established an avenue for companies to demonstrate a need for temporary and/or partial relief from the new rules to ensure its customers do not lose service.[101] Moreover, our decision to phase in the application of the limits over 18 months provides a greater opportunity for carriers to make any necessary adjustments.

40. Critically, the revised methodology now includes an independent variable that captures age of plant, further addressing "retroactivity" concerns with respect to capex. Adding this variable raises the cost limits for carriers that have invested recently, by allowing their costs to be judged relative to a peer group of other carriers that have also invested recently. We also note that application of the limits to operating expenses clearly presents no "retroactivity" concerns.

41. *Predictability and Sufficiency.* We also reject the argument that implementing these benchmarks will undermine the predictability or sufficiency of support.[102] At the outset, we note that this general argument effectively seeks reconsideration of the Commission's policy judgment to adopt a rule imposing limits on capex and opex in the first instance, which is beyond the scope of this order to implement a methodology as directed by the Commission. As the Commission explained in the *USF/ICC Transformation Order*, the HCLS mechanism operates in fundamentally the same way with or without the benchmarks.[103] In both cases, a certain amount of unpredictability exists because a carrier's support depends in part on a national average that changes from year to year, and companies "can only estimate whether their expenditures will be reimbursed through HCLS."[104] Moreover, as the Commission has suggested, if anything, support will now be more predictable for most carriers because the new rule discourages companies from exhausting the fund by over-spending relative to their peers.[105] The addition of several new independent variables that capture attributes that do not change over time (e.g., depth of bedrock, soils difficulty, the percentage of study area that is a federally-recognized Tribal land, the percentage of each study area that lies within a national park, whether the study area is in the Midwest, Northeast, or Alaska) also improves the predictability of support. In addition, as described below, we will use the same regression coefficients for capex and opex in 2013 as those calculated for 2012, which will

[100] *USF/ICC Transformation Order*, 26 FCC Rcd at 17745, para. 221; *see also Members of the Peanut Quota Holders Assoc. v. United States*, 421 F.3d 1323 (Fed. Cir. 2005), *cert. denied*, 548 U.S. 904 (2006) ("The government is free to create programs that convey benefits in the form of property, but, unless the statute itself or surrounding circumstances indicate that such conveyances are intended to be irrevocable, the government does not forfeit its right to withdraw those benefits or qualify them as it chooses.").

[101] *USF/ICC Transformation Order*, 26 FCC Rcd at 17745, para. 222; *see also id*. at 17839-42, paras. 539-44.

[102] *See, e.g.*, Blue Valley Telecommunications Comments, WC Docket No. 10-90 et al., at 4-5 (filed Jan. 18, 2012); TCA Comments, WC Docket No. 10-90 et al., at 5-6 (filed Feb. 24, 2012); Rural Broadband Alliance Reply Comments, WC Docket No. 10-90 et al., at 14-18 (filed Feb. 17, 2012); Letter from Michael J. Balhoff, Balhoff & Williams, LLC, to Marlene H. Dortch, FCC, WC Docket No. 10-90 et al., at Attach. at 8 (dated April 12, 2012).

[103] *USF/ICC Transformation Order*, 26 FCC Rcd at 17745, para. 220.

[104] *Id.*

[105] *See id*.

provide more certainty as we phase in the application of the limits. Accordingly, commenters' concerns that support amounts will fluctuate radically from year to year are speculative and unpersuasive.

42. As for sufficiency, the very purpose of the benchmarks is to ensure that carriers as a whole receive a sufficient (but not excessive) amount of HCLS, which is one component of high-cost support. As discussed above, the methodology compares carriers' costs to those of similarly situated carriers and reduces HCLS only to the extent that a carrier over-spends relative to its peers. Moreover, excess support is redistributed to carriers that otherwise may be at risk of losing HCLS altogether, and may not otherwise be well-positioned to further advance broadband deployment. Thus, the application of benchmarks is not only consistent with the Commission's interpretation of "sufficient" as requiring that the fund remain "sustainable," which the D.C. Circuit found to be a reasonable interpretation in *Rural Cellular Association v. FCC*,[106] but it also complies with the stated intent of section 254 that the Commission's universal service mechanisms should preserve *and advance* universal service.[107]

G. Implementation

43. We will implement the limits on costs eligible for reimbursement though HCLS beginning July 1, 2012, but we will not reduce support amounts immediately by the full amount as calculated using the benchmarks. Instead, we will reduce support beginning July 1, 2012 and until December 31, 2012 by twenty-five percent of the difference between the support calculated using the study area's cost per loop as reported by NECA and the support as limited by the benchmarks, however, the reduction shall not be greater than ten percent of the study area's HCLS support based on the cost data filed with NECA. Beginning January 1, 2013 and until December 31, 2013, we will reduce support by fifty percent of the difference between the support calculated using the study area's cost per loop as reported by NECA in October 2012 and the support as limited by the benchmarks in effect for 2013. Beginning January 1, 2014, when we expect to have updated wire center boundaries, as discussed above, we will update the regression coefficients and incorporate the cost data submitted by NECA in October 2013, and support will be limited, in full, by the benchmarks in effect for 2014.

44. By delaying the full impact of the reductions until 2014, we provide companies who would be adversely affected adequate time to make adjustments and, if necessary, demonstrate that a waiver is warranted either to correct inaccurate boundary information and/or "to ensure that consumers in the area continue to receive voice service."[108] For many companies affected by the benchmarks, the initial twenty-five percent phase-in reduction is a small percentage of their total HCLS. For those whose reduction would be more than ten percent of their HCLS based on NECA cost data, we are limiting the reduction to ten percent for the remainder of 2012. Moreover, continuing to limit the impact of support reductions in 2013 provides an additional opportunity for carriers to make further adjustments. On balance, we find that this measured transition strikes a reasonable balance between the goals of promptly making available additional support to those carriers who, under the new rule, will receive redistributed HCLS to further advance broadband deployment and providing an adequate amount of time for carriers that will experience reductions in support to make adjustments.

45. We also take steps to provide more certainty regarding the operation of the limits on capex and opex.[109] In particular, to provide carriers with more certainty regarding the impact of the fifty

[106] 588 F.3d 1095, 1102-1103 (D.C. Cir. 2009).

[107] *See* 47 U.S.C. § 254(b)(5).

[108] *USF/ICC Transformation Order and FNPRM*, 26 FCC at 17839, para. 539.

[109] NTCA, for example, expressed concern about "dynamic, year-by-year alteration of the caps." *See* Letter from Michael R. Romano, NTCA, to Marlene H. Dortch, FCC, WC Docket No. 10-90 et al., at 1-2 (filed Mar. 23, 2012); Letter from Michael R. Romano, NTCA, to Marlene H. Dortch, FCC, WC Docket No. 10-90 et al., at 1-2 (filed Apr. 2, 2012).

percent phase-in in 2013, we will use the same regression coefficients for capex and opex in 2013 as those calculated for 2012, which enables carriers to estimate their 2013 support now.[110] That is, we will not update the regressions, but we will recalculate individual study area caps based on the 2011 cost data filed with NECA, which will be submitted to the Commission in NECA's annual filing in October 2012. This will allow higher caps for those study areas with significant network investment in 2011.[111] By taking into account the 2011 cost data filed with NECA, study areas that may not have qualified for HCLS based on their costs in prior years may be eligible to qualify for HCLS in 2013, thereby providing those study areas with additional support for broadband investment. In addition, study areas whose costs drop below their computed benchmark for 2013 no longer will be considered capped, and therefore will receive support based on their own actual costs and will be eligible to receive redistributed support like other uncapped study areas.

IV. PROCEDURAL MATTERS

A. Paperwork Reduction Act

46. This document does not contain new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, therefore, it does not contain any new or modified information collection burden for small business concerns with fewer than 25 employees, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4).

B. Final Regulatory Flexibility Act Certification

47. Final Regulatory Flexibility Certification. The Regulatory Flexibility Act of 1980, as amended (RFA)[112] requires that a regulatory flexibility analysis be prepared for rulemaking proceedings, unless the agency certifies that "the rule will not have a significant economic impact on a substantial number of small entities."[113] The RFA generally defines "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[114] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[115] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[116]

[110] In addition, as discussed above, we add several new independent variables that capture attributes that do not change over time thereby improving the predictability of support. *See supra* section III.C and para. 41.

[111] This could allow higher caps for study areas with significant network investment in 2011; for example, if that investment causes the percentage of undepreciated plant to grow.

[112] The RFA, *see* 5 U.S.C. § 601 *et seq*., has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

[113] 5 U.S.C. § 605(b).

[114] 5 U.S.C. § 601(6).

[115] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[116] Small Business Act, 15 U.S.C. § 632.

48. This Order implements, but does not otherwise modify, the rule adopted by the Commission in *USF/ICC Transformation Order*.[117] These clarifications do not create any burdens, benefits, or requirements that were not addressed by the Final Regulatory Flexibility Analysis attached to *USF/ICC Transformation Order*.[118] Therefore, we certify that the requirements of this order will not have a significant economic impact on a substantial number of small entities. The Commission will send a copy of the order including a copy of this final certification, in a report to Congress pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996, *see* 5 U.S.C. § 801(a)(1)(A). In addition, the order and this certification will be sent to the Chief Counsel for Advocacy of the Small Business Administration, and will be published in the Federal Register. *See* 5 U.S.C. § 605(b).

C. Congressional Review Act

49. The Commission will send a copy of this order to Congress and the Government Accountability Office pursuant to the Congressional Review Act.[119]

D. Data Quality Act

50. The Commission certifies that it has complied with the Office of Management and Budget Final Information Quality Bulletin for Peer Review, 70 Fed. Reg. 2664 (2005), and the Data Quality Act, Pub. L. No. 106-554 (2001), codified at 44 U.S.C. § 3516 note, with regard to its reliance on influential scientific information in the Report and Order in GN Docket No. 09-191 and WC Docket No. 07-52.[120]

V. ORDERING CLAUSES

51. Accordingly, IT IS ORDERED, that pursuant to the authority contained in sections 1, 2, 4(i), 201-206, 214, 218-220, 251, 254, and 303(r), and of the Communications Act of 1934, as amended, and section 706 of the Telecommunications Act of 1996, 47 U.S.C. §§ 151, 152, 154(i), 201-206, 214, 218-220, 251, 254, 303(r), 1302, and pursuant to sections 0.91, 0.131, 0.201(d), 0.291, 0.331, 1.3, and 1.427 of the Commission's rules, 47 C.F.R. §§ 0.91, 0.131, 0.201(d), 0.291, 0.331, 1.3, 1.427 and pursuant to the delegations of authority in paragraphs 210, 217, 226 and 1404 of *USF/ICC Transformation* Order, 26 FCC Rcd 17663 (2011), that this Order IS ADOPTED, effective thirty (30) days after publication of the text or summary thereof in the Federal Register.

52. IT IS FURTHER ORDERED, that the Commission SHALL SEND a copy of this Order to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

53. IT IS FURTHER ORDERED, that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Order, including the Final Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the Small Business Administration.

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[117] *See USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 17742-47, paras. 210-26.

[118] *See id*. at 18324-63, App.O.

[119] *See* 5 U.S.C. 801(a)(1)(A).

[120] *See* Letter from Patrick Halley, FCC, to Marlene Dortch, FCC, WC Docket Nos. 10-90, 07-135, 05-337, GN Docket No. 09-51, CC Docket Nos. 01-92, 96-45, 03-109, at Apps. B & C (dated Mar. 9, 2012).

FEDERAL COMMUNICATIONS COMMISSION

Sharon E. Gillett
Chief
Wireline Competition Bureau

APPENDIX A

Modeling Limits on Reimbursable Operating and Capital Costs

Overview. This appendix describes a methodology for determining carrier-specific limits on High Cost Loop Support (HCLS) payments to rate-of-return cost carriers with very high capital expenses (capex) and operating expenses (opex) relative to their similarly situated peers. Building on the record received in response to the *USF/ICC Transformation FNPRM*, and the comments of two peer reviewers,[1] the methodology adopted today refines the HCLS calculation algorithm proposed in the *FNPRM*.[2] This appendix describes both the econometric process used to establish carrier-specific limits to HCLS payments for rate-of-return cost companies and the implementation process.

54. The methodology described herein provides a detailed and implementable mechanism for examining all rural rate-of-return cost study areas and limiting HCLS payments in those study areas that have costs higher than the vast majority of their similarly-situated peers. We use data from all the rural rate-of-return cost carriers.[3] We use quantile regression for parameter estimation rather than ordinary least squares for reasons set forth below. The most significant change in methodology from that described in the *FNPRM* is that this analysis creates two caps, one each on capex and opex, rather than capping eleven different NECA algorithm steps. Because this methodology builds upon NECA's existing algorithm for calculating average loop costs, the revised methodology can be implemented quickly and simply.

55. Background. Today, cost companies eligible for HCLS file with NECA annual detailed cost data, pursuant to Part 36, at the study area level reporting their costs in many different cost categories.[4] The cost categories are then fed into NECA's 26-step Cost Company Loop Cost Algorithm.[5]

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[1] *See* Letter from Patrick Halley, FCC, to Marlene Dortch, FCC, WC Docket Nos. 10-90, 07-135, 05-337, GN Docket No. 09-51, CC Docket Nos. 01-92, 96-45, 03-109, at Apps. B & C (dated March 9, 2012) (Sanyal Peer Review and Waldon Peer Review, respectively).

[2] *Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing a Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up; Universal Service Reform—Mobility Fund*; WC Docket Nos. 10-90, 07-135, 05-337, 03-109, CC Docket Nos. 01-92, 96-45, GN Docket No. 09-51, WT Docket No. 10-208, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC 17663, 18285-94, App. H (2011) (*USF/ICC Transformation Order and FNPRM*); *pets. for review pending sub nom. In re: FCC 11-161*, No. 11-9900 (10th Cir. filed Dec. 8, 2011).

[3] The analysis is based on 2010 NECA data. *See* National Exchange Carrier Assoc., Inc., Universal Service Fund Data, NECA's Study Results, 2010 Report (NECA 2010 USF Data), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf11r10.zip, available at http://transition.fcc.gov/wcb/iatd/neca.html. Pursuant to section 54.305 of the Commission's rules, an acquiring carrier receives support for exchanges acquired from another carrier at the same per-loop support as calculated at the time of transfer. *See* 47 C.F.R. § 54.305. Rural carriers who incorporate acquired exchanges into an existing study area are required to provide separately the cost data for the acquired exchanges and the pre-acquisition study area. Per operation of Commission rules (47 C.F.R. § 54.305(b)), the support for the acquired portion of the study area is frozen. *See* National Exchange Carrier Assoc., Inc., NECA's Overview of Universal Service Fund, Submission of 2010 Study Results, App. F (filed Sept. 30, 2011) (NECA 2010 USF Overview), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf11af.zip, available at http://transition.fcc.gov/wcb/iatd/neca.html. The costs associated with the acquired portion of these study areas are generally lower because the acquired exchanges were from lower-cost carriers, so it would not be reasonable to add either the lines or the costs associated with those lines into the methodology as they would tend to make other cost company costs look high by comparison.

[4] *See* NECA 2010 USF Overview, App. A, at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf10af.zip.

The early algorithm steps calculate intermediate values (based on the reported cost categories) and feed into the later algorithm steps. Algorithm step 25, which calculates the carrier's total unseparated cost for that study area, sums several of the preceding algorithm steps and then feeds into algorithm step 26, which computes the carrier's total unseparated cost per-loop for that study area by dividing the value for algorithm step 25 by the number loops in the study area.[6] HCLS for each study area is then calculated by the Expense Adjustment Algorithm.[7] This algorithm ultimately determines HCLS payments based on a study area's cost per-loop compared to the nationwide average cost per-loop.[8]

56. Methodology for Imposing Limits. Appendix H of the *FNPRM* proposed to create 11 caps (four capex caps and seven opex caps).[9] Several commenters argued that we should reduce the number of caps because efficient carriers might limit their total expenditures by spending a large amount in one cost category to avoid spending even more money in other categories.[10] Additionally, some commenters and one of the peer reviewers suggested the use of a single cap, that is, a single dependent variable in the cost regressions, noting that the 90th percentile of total cost is not the sum of the 90th percentiles of cost components.[11]

57. For the reasons described in the *HCLS Benchmarks Implementation Order*, we conclude that using two caps, one for capex and one for opex, provides the appropriate balance between identifying unusually high costs and providing carriers operational flexibility.[12]

58. To implement this revised framework, the updated methodology separates algorithm step 25 (Total Unseparated Costs) into total capex and total opex cost components. The current algorithm step 25 sums algorithm steps 13 through 24. As a result of the updated methodology, capex components are now summed into algorithm step 25A and opex components are summed into algorithm step 25B. Consistent with the methodology proposed in Appendix H, a company whose actual costs for algorithm step 25A or algorithm step 25B are above the 90th percentile for that cost, compared to similarly situated companies, would be limited to recovering amounts that correspond to the 90th percentile of capex or opex costs, i.e. the costs that ninety percent of similarly situated companies would be estimated to have by the regression equation.[13] Algorithm step 25C becomes the new Total Unseparated Costs by summing

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[5] *See* NECA 2010 USF Overview, App. B, at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf10af.zip.

[6] Although NECA labels each algorithm step with a line number, we continue to use the word "step" in our description of the methodology to avoid possible confusion of lines with loops.

[7] *See* NECA 2010 USF Overview, App. B, at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf10af.zip.

[8] The national average cost per loop used in the HCLS support calculation is set to ensure that total HCLS disbursements stay within the HCLS cap that year rather than the actual average loop cost. See 47 C.F.R. §§ 36.603(a), 36.622. Rural carriers receive support equal to 65 percent of their costs in excess of 115 percent of the NACPL. Additionally, carriers receive support equal to 75 percent for costs in excess of 150 percent of the NACPL. See 47 C.F.R. §§ 36.601-.631.

[9] *USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 18288-89, App. H, paras. 15-16.

[10] Accipiter Comments at 19 and NASUCA Comments at 52. Rural Association Comments, App. E, at 6-7 (Koenker).

[11] Nebraska Rural Comments/ Rural Associations Comments at App. E, 5 (Koenker); Sanyal Peer Review at 1.

[12] *See supra HCLS Benchmarks Implementation Order* at para. 15.

[13] The term "similarly-situated peers" means that, based on data from all the carriers in the analysis, if there were (hypothetically) 100 study areas with independent variable values that were the same as those with the study area in question, 90 of them would be expected to have capex and opex costs equal to or less than the 90th percentile prediction.

algorithm steps 25A and 25B. It then feeds into algorithm step 26 (Study Area Cost per Loop) and the subsequent Expense Adjustment Algorithm as before. We identify the capex and opex components below.

59. Use of Quantile Regression. As proposed in the *FNPRM*, we use quantile regression to estimate the caps for the capex and opex cost components.[14] The goal of the regression methodology is to identify study areas that have capex and opex costs that are much higher than their similarly-situated peers and to cap their cost recovery at amounts that are no higher than the vast majority of similarly-situated study areas. Quantile regression allows us to directly estimate the 90th percentile costs for study areas with given characteristics. The critical values become the capex and opex caps.

60. We conclude that quantile regression is preferable to ordinary least squares for this application. Ordinary least squares regression cannot be used to identify the proper critical values in the tail of the cost distribution without making strong assumptions about the nature of the cost distribution, in particular, that error terms are Gaussian (normally distributed) and homoscedastic.[15] In contrast, quantile regression requires no assumptions about the error terms. This is important because the error terms of the ordinary least squares regressions for capex and opex are both heteroscedastic and non-normal.[16] While methods exist to estimate corrections for heteroscedasticity and non-normal error terms in ordinary least squares regression, these would require additional computational steps without improving the precision of the quantile estimate.

61. Quantile regression is also more resistant to the presence of outliers than ordinary least squares, which can produce biased parameter estimates when outliers are present.[17] Thus, quantile regression parameter estimates are more stable than ordinary least squares parameter estimates if the data include outliers.[18] And although ordinary least squares has methods available for dealing with outliers, such as excluding them from the analysis or using dummy variables, these methods generally require an exercise of judgment to identify outliers. Quantile regression largely avoids the need to make such determinations.

62. Another significant advantage of quantile regression is that it allows the independent variables to have different effects on the dependent variable in the different quantiles.[19] Thus, for example, as the percentage of a study area that is national parkland increases (holding everything else constant), the size of the study area's cost increase could differ based on where it falls in the cost distribution of similarly-situated study areas (which quantile it is in). This is not allowed in ordinary least squares, which assumes that the marginal effect is the same on all study areas. Given that we are examining study areas with high costs relative to other study areas conditioned on the independent variables used in the design, this is a helpful property.

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[14] Both peer reviewers agreed that quantile regression is the proper tool for this analysis. Waldon Peer Review at 1 and Sanyal Peer Review at 1. *See also*, Rural Associations Comments at App. E, 7 (Koenker).

[15] Even though OLS provides unbiased parameter estimates in the presence of heteroscedasticity, the standard errors are not unbiased. Because the standard errors would be required to determine which observations lie above the critical cutoff values, in the presence of problems such as heteroscedasticity, some adjustment to the standard errors would be needed.

[16] For the capex model, we ran the regressions using ordinary least squares and performed two tests for heteroscedasticity: the White test and the Breusch-Pagan / Cook-Weisberg test. Both tests clearly rejected the null hypothesis of homoscedasticity with a p-value of less than .0001. Further, the Cameron & Trivedi's decomposition of IM-test shows that the error terms are not normal – the error terms suffer from kurtosis (p-value=0.0051), and skewness (p-value = 0.0017), which are statistically significant.

[17] G.S. Madalla, Introduction to Econometrics, 2nd Ed. 88 (1992) (Macmillan Publishing Co).

[18] Lingxin Hao and Daniel Q. Naiman, Quantile Regression 20 (2007) (Sage Publications).

[19] *See* Fig. 4 and surrounding text in "Quantile Regression" by Koenker and Hallock, Journal of Economic Perspectives, Volume 15, Number 4, Fall 2001, Pages 143–156.

63. Use of the Log-Log Specification. As proposed in the *FNPRM*, we use the log-log specification, and therefore take the natural log of the variables most sensitive to scale effects. For the dependent variables, the capex regression uses the natural log of capex, and the opex regression uses the natural log of opex. We also use the natural logs of all independent variables used in the methodology except those that are dummy variables, a pure index, or a percentage (namely, *Climate*, *Difficulty*, *PctTribalLand*, *PctPark*, *Alaska*, *MW*, and *NE*).

64. Some commenters and a peer reviewer argued that the Commission failed to demonstrate the need for taking the natural logs for both the dependent and independent variables.[20] Additionally, a commenter argued that doing so was appropriate when the dependent variable is known to have a multiplicative relationship, and therefore the regressions should use the variables in levels (i.e., that we should not take the natural log of the variables) or that we should examine cost per loop.[21] Another commenter, as well as both peer reviewers, noted that the manner in which zeros are dealt with, even when using quantile regression, can affect the results.[22]

65. Because our econometric specification is a reduced form, taking the logs of both the dependent and independent variables is acceptable so long as the resulting relationship is linear. We disagree with commenters who suggested that we should leave the variables in levels. Figure 1 shows that the scatter plot of (the level of) opex versus (the level of) the number of loops is not obviously linear. In contrast, Figure 2 displays the scatter plot of the natural log of opex versus the natural log of loops, and shows that the relationship is linear. Further, in a simple ordinary least squares regression of opex on the number of loops and the natural log of the number of loops, both variables are significant. This indicates that the relationship between opex and loops is nonlinear.

66. Further, some commenters argued that we should predict costs per loop and that if we took this approach, density would become an important independent variable.[23] Figure 3 shows that opex per loop as a function of density is nonlinear.[24] In contrast, Figure 4 shows that the relationship between the natural log of opex and density is linear. Similarly, the graph of capex versus road miles does not appear to be linear, but natural log of capex versus the natural log of road miles does. We thus conclude that the log transformation of the dependent and independent variables that are scale sensitive is the appropriate specification.

67. Finally, the reduction in the number of regressions in the final methodology eliminates the problem of taking the natural log of zero in the dependent variable. Because the final methodology uses two regressions rather than eleven, the values of the dependent variables are never less than or equal to zero, as was the case for many of the values in the algorithm step 8 regression as originally proposed in the *FNPRM*. Further, none of the independent variables that we use have zero values.[25]

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[20] Nebraska Rural Comments Pages 41-45; NASUCA Comments at 54; Sanyal Peer Review at 3; Waldon Peer Review at 2.

[21] Nebraska Rural Independent Companies (NRIC) Comments at 42.

[22] Rural Associations Comments at App. E, 8 (Koenker); Sanyal Peer Review at 3; Waldon Peer Review at 2.

[23] NRIC Comments at 14-15.

[24] This is unsurprising: Chart 2 (page 14) in NRIC's Capex Study shows a non-linear relationship as well. *See* Letter from Thomas Moorman, Counsel to Nebraska Rural Independent Companies, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90, 05-337, GN Docket No. 09-51, Attach., at 14 (Nebraska Rural Independent Companies' Capital Expenditure Study: Predicting the Cost of Fiber to the Premise) (dated Jan. 7, 2011) (NRIC's Capex Study).

[25] In testing land area, housing units and census blocks with breakouts for urbanized areas or urbanized clusters, we used the totals of these variables and the percent that were rural. All study areas have positive values for land area, census blocks and housing units, so we were able to calculate the natural logs for all observations for these variables. Ultimately, however, census blocks and housing units were not included in the final methodology. Also, a peer reviewer noted that when calculating the caps, the methodology as proposed in the FNPRM failed to account for the

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68. Fit of the Regression Model. Some commenters argued that the regressions in the proposed methodology suffered from low pseudo R-square values, and therefore the proposed methodology should be abandoned.[26] Another commenter asserted that alternative models (i.e., those that were based on levels or on cost per loop) were superior to the proposed model because the R-square values were higher when using levels or cost per loop.[27]

69. We conclude that our revised methodology offers sufficient predictive power. Although the pseudo R-square values in the proposed methodology ranged from 0.2745 to 0.5863, the pseudo R-square values in the revised methodology are .6684 for capex and 0.6234 for opex. We conclude that our final specification has sufficient predictive power to provide a reliable method for setting reasonable limits on carriers' costs. We also note that because the dependent variables are different, and because we are performing quantile regression rather than ordinary least squares regression – the method proposed by NRIC – we cannot directly compare the pseudo R-square values from our methodology to the R-square values from commenters' alternative specifications.[28]

70. Elimination of Independent Variables from Specification. If a variable is significant in either the capex or opex regression, we include it in both regressions. We are cognizant of Dr. Koenker's comments that in quantile regression (as in ordinary least squares regression), the inclusion of non-significant variables can inflate the variance of the prediction (yet leave the prediction unbiased).[29] Nevertheless, we keep variables that are significant in either regression in both regressions because they can have offsetting effects in the regressions. For example, a carrier facing close-to-the-surface bedrock (which would make trenching more difficult than usual) may find it efficient to use an aerial solution rather than to trench through bedrock. The presence of close-to-the-surface bedrock could then lower the carrier's capex cost but raise its opex cost because cables on poles may be more costly to maintain. Thus, bedrock could raise that carrier's opex costs but could plausibly lower that carrier's capex expenditures. If we omitted bedrock from the capex regression, we could be biasing the coefficient values in the regression and therefore biasing the predicted 90th percentile values for capex.

71. Further, we note that unlike the regressions in the proposed methodology, the vast majority of the variables in the updated methodology's regressions are significant in both regressions. We also note that adding statistically insignificant variables to our regressions do not bias our predictions.[30] In light of all these considerations, we therefore believe it is better to include variables that are significant in either of the regressions in both.

72. In its Updated Opex Study, NRIC suggests creating a cap that uses not just the regression coefficients, but also adds a standard deviation to each regression coefficient.[31] We decline to do so here. Adding the estimated standard error to the parameter estimates is a non-standard way of creating a

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fact that we added one to all the dependent variables for which we took the natural logs. *See* Waldon Peer Review at 3. Because we did not need to add 1 to any of the dependent variables in the refined methodology that we now adopt, that situation is impossible here.

[26] NASUCA Comments at 41, 49.

[27] NRIC at 15.

[28] W. Greene, Econometric Analysis, 2nd Ed. 54 (1993) (Macmillan Publishing Co).

[29] Rural Associations Comments at App. E, 7 (Koenker).

[30] On this point Koenker agreed. *See id*.

[31] *See* Letter from Cheryl L. Parrino, Parrino Strategic Consulting Group, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-51, WC Docket Nos. 10-90, 05-337, CC Docket No. 01-92, Attach. 2 at 3-4 (Operating Expense Study Sponsored by the Nebraska Rural Companies: Update to Predicting the Operating Expenses of Rate-of-Return Telecommunications Companies) (dated Sept. 29, 2011) (Updated Opex Study).

confidence interval in the context of quantile regression. In contrast, using the regression quantiles methodology gives a direct unbiased estimate of the 90th percentile predictions for capex and opex.[32]

73. Use of Census Block Centroids. Consistent with the methodology set forth in the *FNPRM*, we determine which census blocks are in each study area by using the census blocks' centroids. This enables us to generate certain demographic variables for each study area, such as the number of housing units in a study area. Because study area boundaries do not always coincide with census block boundaries, some census blocks will fall into two different study areas. Where a census block's centroid falls inside the study area boundary, we associate that block with that study area, and if a census block's centroid falls outside of the study area boundary, we do not.

74. Some commenters suggested that associating census blocks with study areas based on the census block's centroid can distort population and/or housing unit counts.[33] While NRIC argues that such errors do not necessarily cancel each other out, they did not have a material impact on the cost caps in the case of Nebraska.[34] We conclude that our approach is reasonable. We could split census blocks that cross study area boundaries into pieces and then assume that end-user locations are spread evenly within census blocks so that we proportionately attribute housing units to study areas. This would increase computational complexity but not necessarily accuracy because end-user locations are not uniformly distributed within census blocks. We further note that the vast majority of study areas have many blocks and therefore such errors would tend to cancel each other out. Of the 726 study areas covered by the updated methodology have 1.1 million census blocks in them, so on average, each study area has about 1,567 census blocks. The smallest number of census blocks in a study area is 26, the 5th percentile is 132, and the 10th percentile is 187. Therefore, the vast majority of study areas would not be affected by this issue. Also, there is only one variable that uses the number of housing units (which is derived from the census blocks in the analysis), the natural log of density (see *LnDensity* below), so the effect of any error should be small.

75. Dependent Variables. As described above, the dependent variables in the regressions are the natural log of the capex components and the natural log of opex components of algorithm step 25. Below we define capex and opex, but in short, we assign all the constituent parts of algorithm step 25, which calculates the carrier's total unseparated cost for that study area, to either capex or opex. Because we are now aggregating capex costs into a single capex variable, and operational costs into an opex variable, variations in individual capex and opex components are smoothed. This allows us to include data on all elements of capex and opex while still achieving good regression fits.

76. For the purpose of the updated methodology that we adopt today, we define capex to be the plant-related costs in the current algorithm step 25. We thus include the return to capital components, which are algorithm step 23 and algorithm step 24.[35] We also include depreciation in capex (algorithm step 17 and algorithm step 18).[36] Although accounting textbooks typically define depreciation as an operating expense, they do so because firms need to recognize a periodic charge against earnings to

[32] Another option would be to adjust the capex and opex 90th percentile predictions by a standard error. We decline to do this for the same reason we decline to add a standard error to each variable coefficient.

[33] Accipiter Comments at 14, Moss Adams Comments at 14, NRIC Comments at 30, Nemont Reply Comments at 3.

[34] NRIC Comments at 30-33.

[35] Specifically, algorithm step 23 is the return component for cable and wire facility Category 1, and algorithm step 24 is the return component for central office equipment Category 4.13. Included in these return components are algorithm steps 7 and 8 (materials and supplies assigned to cable and wire facilities Category 1 and central office equipment category 4.13 respectively), which are plant-related capital costs, and which were erroneously considered to be opex in Appendix H.

[36] Algorithm step 17 is depreciation and amortization expense assigned to cable and wire facility Category 1. Algorithm step 18 is depreciation and amortization expense assigned to central office equipment Category 4.13.

expense the declining value of assets over the estimated life of the assets.[37] Because depreciation is inherently tied to the carriers' asset investment decisions, we assign it to capex. We note that in its Opex Study, NRIC considered depreciation to be sufficiently non-operations-based that NRIC took depreciation out of opex.[38] Although some commenters urged us to exclude depreciation from the methodology altogether,[39] we disagree for two reasons. First, depreciation is a valid measure of plant that goes beyond the measure of net plant that goes into algorithm steps 23 and 24. Depreciation is a function of not just the amount of gross plant, but also the useful life of the plant that is used, a meaningful measure. Second, by including depreciation, we include all the portions of the existing algorithm step 25.

77. For the purpose of the updated methodology, we define opex to be the remaining components of the current algorithm step 25. We include algorithm steps 13 and 14 in opex because they are maintenance expenses.[40] We also include algorithm steps 15 and 16 in opex because they are network expenses.[41] Algorithm step 21 in included in opex because it is corporate benefits.[42] Below we discuss in more detail the other algorithm steps included in opex.

78. Algorithm step 19 is corporate operations expense, which is limited in accordance with section 36.621(a)(4) of the Commission's recently revised rules.[43] Although this step is already limited by the updated formula limiting recovery of corporate operations expenses, and was excluded in the methodology as proposed in the *FNPRM*, we now include it in opex because the goal of the updated methodology is to examine opex in its entirety. Algorithm step 19 uses DL535 and DL550, which are the lesser of the allowable or actual corporate operations expenses, not the unadjusted corporate operations expenses, so a study area that is affected by §36.621(a)(4) is not being affected twice by the higher-than-allowable amount.

79. We similarly include algorithm step 20 (operating taxes) in opex in the revised methodology. Although the methodology proposed in Appendix H excluded step 20, after further consideration, we concluded that taxes are an expense that must be paid, just like other operational expenses.[44]

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[37] *See, e.g.* Williams, Stanga and Holder, Second Edition, Intermediate Accounting, Harcourt Brace Jovanovich, Inc. [1987] Page 550.

[38] *See* Letter from Paul M. Schudel, Counsel to Nebraska Rural Independent Companies, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90, 07-135, 05-337, 03-109, GN Docket No. 09-51, CC Docket Nos. 01-92, 96-45, Attach. at 6 (Operating Expense Study Sponsored by the Nebraska Rural Independent Companies and Telegee Alliance of Certified Public Accounting Firms: Predicting the Operating Expenses of Rate-of-Return Telecommunications Companies) (dated May 10, 2011) (NRIC's Opex Study). The NRIC Capex Study did not use accounting costs, and so it did not directly ascribe depreciation to capex.

[39] *See, e.g.*, NRIC Comments at 59; Moss Adams et al. Comments at 15-18; Chillicothe Comments at 6-9.

[40] Algorithm step 13 is cable and wire facilities maintenance and algorithm step 14 is central office equipment maintenance expense assigned to Category 4.13.

[41] Algorithm step 15 is network support expense plus general support expenses assigned to cable and wire facility Category 1 and central office equipment Category 4.13. Algorithm step 16 is network operations expenses assigned to cable and wire facility Category 1 and central office equipment Category 4.13. These expenses are not capitalized in accordance with FCC Report 43-04 – Report Definition page 24, available at http://transition.fcc.gov/wcb/armis/documents/2007PDFs/4304c07.pdf.

[42] Specifically, algorithm step 21 is benefits other than corporate operations expense assigned to cable and wire facility Category 1 and central office equipment Category 4.13.

[43] Specifically, algorithm step 19 is corporate operations expense assigned to cable and wire facility Category 4.13, which is limited in accordance with §36.621(a)(4).

[44] We understand that tax rates are beyond a carrier's control, but so are many other rates and prices, such as prevailing local wage rates or the prices of electricity and copper. We expect carriers relying on universal service support, like providers operating in the market, to make efficient investment and operating decisions in light of these

(continued)

80. Finally, we include algorithm step 22 (rents) in opex.[45] This step was excluded from the proposed methodology in Appendix H because the regression fit was poor. Because we can now include rents as a part of opex as a whole as opposed to in its own separate category, we include it in the updated methodology.

81. Independent Variable Specification. Our reduced-form regression specification uses as independent variables exogenous factors that we believe affect a study area's capex and opex. These variables fall into the following categories: scale, age of plant, customer dispersion, and geography.[46] Additionally, the independent variables we examined and include in this updated methodology are those that are currently available to the Commission and exist for all study areas in the regression analysis.

82. To the extent that we had the requisite data, we also tested other variables that commenters suggested be included. First we describe the variables we include in the methodology, then the variables that we examined and ultimately excluded, and finally, the variables that commenters suggested but that we could not include in the methodology due to data issues. All geographic independent variables were rolled up to the study area using Tele Atlas study area boundary data.[47] We do not include inputs to the production process (such as employees) in the regressions because carriers can choose the amount of these inputs. In other words, carriers with markedly higher costs than their similarly situated peers may be using substantially more of these inputs.[48]

83. Table 1 and Table 2 respectively show descriptive statistics for and correlations between the variables included in the updated methodology. The regression results are included in Table 3.[49]

84. Scale. We use several variables to measure scale: the number of loops, road miles, road crossings, and the number of study areas held under common control in the state. All the scale measures

(...continued from previous page)
costs, and by estimating the 90th percentile as the basis for the cost caps, we allow providers substantial flexibility to do so without exceeding the caps. Further, were we to have a single cap based on total unseparated costs (algorithm step 25) as some commenters suggest rather than the two existing caps, we would be including taxes. Rural Association Comments, App. E, at 5 (Koenker); Sanyal Peer Review at 1.

[45] Specifically, algorithm step 22 is rents assigned to cable and wire facility Category 1 and central office equipment Category 4.13.

[46] Some commenters stated that some variables in Appendix H were not cost drivers or were not good proxies. Accipiter Comments at 25-26, Moss Adams at 12. This is largely moot because we have mostly eliminated the variables criticized by the commenters, such as the number of census blocks in rural areas, from the final methodology. We also point out that is not necessary to have only cost drivers in the analysis if proxies can be found that are sufficiently correlated with the cost drivers. We used cost-driving variables directly where available and proxies where necessary.

[47] TomTom Telecommunications Suite 2011.09 (formerly Tele Atlas North America). TomTom acquired Tele Atlas and subsequently re-branded the wire center boundary data. Because commenters refer to the earlier brand name, for purposes of this appendix and the accompanying order, we refer to the wire center boundary data as Tele Atlas data. The Tele Atlas wire center boundaries were dissolved to create study area boundaries. Earlier study area boundary versions and other information were also used to exclude the acquired portions of study areas that were associated with frozen support. *See* Letter from Patrick Halley, FCC, to Marlene Dortch, FCC, WC Docket Nos. 10-90, 07-135, 05-337, GN Docket No. 09-51, CC Docket Nos. 01-92, 96-45, 03-109.

[48] We thus exclude variables that the updated NRIC Opex study included such as employees and net wireline plant per access line.

[49] The data and the code to verify this are available at the following: http://www.fcc.gov/encyclopedia/rate-return-resources.

we include in the updated methodology are significant in the opex regression and all but *LnRoadMiles* are significant in the capex regression.[50]

85. Because the number of loops is a direct measure for the scale of the study area, we include the natural log of the number of loops (*LnLoops*) in the updated methodology.[51] We expect that the amount of plant a carrier must install will be positively correlated with capex and opex costs because more loops require more investment and operations cost.[52] *LnLoops* is statistically significant.

86. We also include the natural log of the number of road miles (*LnRoadMiles*), which is a proxy for total loop length.[53] Several commenters argued that some measure of loop length was an important variable.[54] Although some (but not all) cost carriers may report such data to the Department of Agriculture's Rural Utilities Service (RUS), such data are both incomplete and unavailable to the Bureau. We agree with NRIC that cable generally follows roads, so the number of road miles in a study area should correlate with the cabling required to serve that area.[55]

87. In its Capital Expenditure Study, NRIC predicted that road intersections would slow fiber construction and impose other costs and found that the number of intersections was a significant predictor of predicted construction costs.[56] We agree that the number of such crossings is another good proxy for scale and therefore included the natural log of road crossings (*LnRoadCrossings*).[57]

88. The scale variables (*LnRoadMiles*) and road crossings (*LnRoadCrossings*) are significant in the opex regression, but have the opposite sign from each other. Only road crossings are significant in the capex regression.

89. Our last scale variable is the number of study areas in the state that are owned by the

[50] For the purpose of the updated methodology, we consider a variable to be significant when the p-value is less than 0.10. While studies often use a cutoff p-value of 0.05, that is generally for statistical inference. Because we are creating predictions, we wish to be somewhat more inclusive to lessen the chance of omitted variable bias, so we therefore used the higher p-value.

[51] We calculate *LnLoops* using the 2010 DL060 loop count in NECA's October 2011 filing. *See* NECA 2010 USF Data, http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/usf11r10.zip, available at http://transition.fcc.gov/wcb/iatd/neca.html. We use DL060 loops because the capex and opex costs we use are associated with all the study area's loops, not just the supported DL070 loops.

[52] Arguably loops are an input to the production process, which as we emphasize above, should be excluded from the independent variable list. Because loops are put in at a customer's request, however, and because carriers are generally restricted in their ability to refuse such requests pursuant to carrier-of-last-resort obligations, we do not consider loop counts to be a carrier-controlled cost driver like the number of employees.

[53] For most of the study areas, road miles data come from the ESRI ArcGIS StreetMap (http://gislab.allegheny.edu/Documents/StreeMap_USA.pdf) (ESRI Street Map). Because ESRI Street Map does not include data for Guam and American Samoa, we used Tiger files for these study areas, which because they were generated for Census applications, may be less accurate for transportation applications. The Tiger files are available at the US 2010 Census website: http://www2.census.gov/cgi-bin/shapefiles2009/national-files. Because only two study areas were affected, we concluded that using a separate source data for road miles for these study areas reasonable. We found that the slope on *LnRoadMiles* and *LnRoadCrossings* were unaffected by using the Tiger files for Guam and American Samoa.

[54] See Central Texas at 5 and Accipiter Comments at 26.

[55] NRIC Comments at 16.

[56] NRIC Capex Study at 10. We believe that maintenance costs would also be higher in the presence of additional road crossings because of travel delays and the increased costs associated with the dangers of intersections.

[57] NRIC reiterated the usefulness of the road crossing data in its comments. NRIC Comments at 25. Note that we calculate road crossings rather than intersections because counting intersections is computationally very burdensome. Two roads that cross at right angles (forming a plus sign) create four crossings. We believe that road crossings is a good proxy for road intersections.

same holding company or have common control in the state (*LnStateSACs*).[58] We anticipated that this variable would be a good predictor of capex and opex costs because some expenses could be shared among study areas. For capex, study areas that are part of a larger organization (i.e., the study area has more commonly-owned study areas in the state) may allow installation crews to be deployed more efficiently. For opex, study areas that are part of a larger organization can share various expenses, especially headquarters-related expenses, which would allow for some specialization among management employees. We found *LnStateSACs* to be significant for both capex and opex.

90. Age of Plant. Commenters stated that age of plant was an important variable for two reasons: first, because the cost of recent capital investments is higher due to inflation and second, because the return component of capital expenses is calculated on net plant, and recent investment will be depreciated less fully than old plant.[59] While the Bureau cannot readily determine the average age of carriers' plant, the percentage of the plant that has not yet been depreciated (*PctUndepPlant*) should be highly correlated with plant age: more recently installed plant will be less depreciated.[60] Holding all else constant, the less of a carrier's plant is depreciated (which yields a higher *PctUndepPlant*), the higher its capex should be. The intuition for the effect of *PctUndepPlant* on opex is ambiguous. We find that this variable is a strong cost predictor for both capex and opex.

91. Customer Dispersion. We include three variables that account for customer dispersion. Many commenters asserted that density was an important cost predictor, and that their costs are high in part because of the rural areas they serve.[61] We therefore expect that density is negatively correlated with both capex and opex costs. Density (*LnDensity*) is the natural log of the following quotient: number of housing units in the study area divided by the size of the study area in square miles as reported by the Tele Atlas boundaries.[62] We find that it is significant in both regressions.[63]

92. We also include the natural log of the number of exchanges in the study area as a proxy for customer dispersion (*LnExchanges*). Although the straightforward measure of density calculates the average customer density within the study area, the number of exchanges roughly accounts for the number of population centers within the study area because most population centers will have their own exchanges. The more population centers (holding other factors constant), the higher capex and opex costs will be because more cabling will be required to connect the customers within the study area to each other, and the farther the employees will need to drive to fix any troubles. The variable *LnExchanges* is significant in both regressions.

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[58] The holding company/common control ownership information can be found in the Universal Service Monitoring Report, CC Docket No. 98-202, app. (2011) (HC NECA ILEC Support Data - by Study Area.xls), available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/2011_MR_Supplementary_Material.zip. (last visited Feb. 16, 2012)

[59] *See, e.g.*, Accipiter Comments at 5, Guadalupe Comments at 3. In its comments, Carriers for Progress in Rural America (at 6) states that population growth should be added to the model to account for the new plant associated with new neighborhoods. The variables percentage change in undepreciated plant and percentage change in loops account for this.

[60] We calculate the percentage of the plant that has yet to be depreciated as 100 * DL220 / DL160 (i.e., 100*net plant/gross plant).

[61] *See, e.g.*, Guadalupe Valley Comments at 3, Interbel Comments at 10, Moss Adams Comments at 8.

[62] *See generally*, *supra* note 47. We also tested *LnWtDensity*, which accounts for density at the block level. We calculate this by calculating each census block's density (housing units in the block divided by square miles of the block) and then calculating the weighted average density weighting by the number of housing units in each block. *LnWtDensity* is the natural log of weighted density. *LnWtDensity* is not significant.

[63] Because we are using a log-log model, the natural log of density (the number of housing units divided by square miles) captures the effects of both the size of the study area and the number of housing units. We tested the regressions with the natural log of housing units and the natural log of square miles (but omitting the natural log of density), and the results were very similar.

93. Our final customer dispersion variable accounts for the portion of households in urban clusters or urbanized areas (*PctUrban*).[64] To the extent that rural carriers also serve urbanized pockets, we would expect their costs to be higher, holding all other variables (including road miles) constant, because wage rates may be higher near urbanized areas. We thus expect *PctUrban* to be positively correlated to opex, and it is. *PctUrban*'s effect on capex is less clear: the labor costs associated with trenching are capitalized, so to the extent that labor near urban areas is more expensive, the higher capital costs should be. But capitalized labor is only one of many costs in capex, so the effect may not be strong. *PctUrban* is positive but not significant in the capex regression.

94. Geography. Commenters suggested the inclusion of several geographically-based variables such as soil type. We agree. When creating many of the indexes for geographic variables, we took into account the location of roads within the study area because cabling generally follows roads.[65] For these variables we overlaid road data in the study area with our sources of geographic information and calculated variables that were either percentages, or where appropriate, averages.

95. For example, commenters stated that soil type is an important cost predictor.[66] We therefore constructed a soil difficulty index (*Difficulty*). This index is similar to the index in the NRIC capex study in which soil types were matched with construction difficulty values established for the Commission's High Cost Proxy Model (HCPM), which the Commission used to calculate high-cost support for non-rural carriers.[67] The STATSGO2 database we use lists more soil types than the original STATSGO database, however, so there are many soil types in the STATSGO2 database for which there are no construction difficulty values from the HCPM. NRIC tried several options, but settled on assuming the soil difficulty level to be 1 (the lowest level of difficulty) for those soil types not found in the table.[68] Our soil difficulty index builds on the NRIC methodology. When faced with soil types that do not appear on the original HCPM list, we interpolate the difficulty rating based on similar soil types in the HCPM list. We manually associate unmatched soil types from the STATSGO2 data with similar soil texture in the original HCPM table, and used the difficulty rating of the similar soil types in the HCPM list for the new soil type in the STATSGO2 database. The new extended table associates a difficulty rating for all soil types in the STATSGO2 database.[69] We then calculated the average soil construction value along the roads in each study area.

96. We find soil difficulty to be a statistically significant predictor in opex. Although NRIC found that soil difficulty was a significant predictor of construction costs, *Difficulty* is positive in our capex, but not significant.[70] Although we also expected soil difficulty to be positive in our capex regression, an alternative hypothesis is that in locations where trenching is unusually expensive, an efficient carrier may install aerial plant (use poles rather than trench). This would involve lower capital costs than trenching, but higher future operations costs. Thus, it is plausible that in the presence of difficult-to-trench soils, carriers experience no obvious change in capex or, in some circumstances possibly even reduced capex costs.

[64] *PctUrban* is the ratio of the number of housing units in either urbanized clusters or urbanized areas divided by the total number of housing units in the study area.

[65] *See supra* para. 86.

[66] See, e.g., ATC Comments at 3, Calaveras Comments at 7, Eagle Telephone Comments at 4, Guadalupe Comments at 2.

[67] NRIC Capex study at 9.

[68] *See* Letter from Thomas J. Moorman, Counsel to Nebraska Rural Independent Companies, to Marlene H. Dortch, FCC, Attach. (dated Jan.27, 2012).

[69] This table is available at http://www.fcc.gov/encyclopedia/rate-return-resources.

[70] NRIC Capex Study at 18.

97. Because NRIC suggested that we account for close-to-the-surface bedrock, we calculated the percentage of road miles within each study area where bedrock was within 36 inches of the surface (*PctBedrock36*).[71] The NRIC capex study found that predicted construction costs were positively associated with close-to-the-surface bedrock, so we might expect that the coefficient on *PctBedrock36* should be positive in the capex regression.[72]

98. We find that close-to-the-surface bedrock is significant in the opex regression, but that it is not significant in the capex regression. This result could occur for the same reasons as for soil construction difficulty above or because the construction difficulty of bedrock has already been captured by the soil difficulty variable.

99. Pointing to the NRIC Capex study, which suggested that construction costs are higher in areas where the ground is frozen more often, several commenters argued that the regressions should include a frost index.[73] The frost index in the NRIC capex study uses of the number of frost-free days from the SSURGO data. Unfortunately, this information is not available for all areas in the STATSGO2 database. We believe that the USDA's hardiness index is a useful proxy for this information, and we use it to create a simple index called *Climate* that is based on the average annual minimum temperature.[74] The lower the minimum temperature, the more days the ground is likely to be frozen. The higher the index, the fewer frost-free days the study area would have. Based on the comments in the record, we expected this variable to be negatively correlated with capex (the higher the index, the more frost-free days the area should have, so construction costs should be lower).

100. The Climate variable (*Climate*) is positive and has low p-values in the regressions, which means that it is unlikely to be a spurious result. However, it is positively correlated with capex and opex.

101. Commenters also stated that it is more difficult to construct and maintain networks on tribal lands and in national parks because of permitting and similar issues,[75] so we include two additional variables: (1) the percentage of each study area that is a federally-recognized Tribal land (*PctTribalLand*),[76] and (2) the percentage of each study area that lies within a national park (*PctParkLand*).[77]

102. The coefficient for the percentage of the study area that is tribal land (*PctTribalLand*) is positive for both capex and opex regressions, but is significant in only the opex regression. The percentage of the study area that is national park land (*PctParkLand*) is positive and significant in both regressions. As can be seen in Table 1, most of the study areas do not contain either tribal or national park land, and it may be a simple lack of data that causes a lack of significance for *PctTribalLand* in the capex regression. Nonetheless, we agree that both capex and opex costs could be higher in the presence

[71] The NRIC Capex Study found that predicted construction costs were positively associated with close-to-the-surface bedrock (Capex Study at 17), and in its comments, NRIC suggested including bedrock information (NRIC Comments at 24).

[72] NRIC Capex Study at 17. NRIC did not include bedrock in its final regression, however.

[73] Blooston Comments at 2, Interbel Comments at 10, Nebraska Rural Comments at 21.

[74] The hardiness index uses the zone numbers in the 2012 USDA Plant Hardiness Zone Map (available at http://www.usna.usda.gov/Hardzone/). The index increments by 0.5 for each zone, so Zone 1A is 1.0, zone 1B is 1.5, Zone 2A is 2, Zone 2B is 2.5, etc. This table is available at http://www.fcc.gov/encyclopedia/rate-return-resources. The *Climate* index is the average of the index along the roads in the study area. We also think that the variable *climate* controls for the length of the construction season that Moss Adams suggested (Moss Adams Comments at 12).

[75] Interbel Comments at 3, New Mexico Exchange Carrier Group at 14-15.

[76] Tribal land information is available from the US Census Bureau at http://www.census.gov/cgi-bin/geo/shapefiles2010/main.

[77] National Park data are available at http://www.bts.gov/publications/national_transportation_atlas_database/2011/.

of these factors, so we include them in the model.

103. Finally, based on comments in the record that certain areas of the country face unique circumstances, we tested several regional variables. Alaskan commenters suggested that Alaska was unique because of its harsh climate and other factors.[78] We therefore added the dummy variable *Alaska* to the regressions, which equals 1 for the 17 study areas in Alaska and zero elsewhere.

104. We also include regional dummies because in its Original Opex study NRIC found that opex costs were correlated with regions.[79] Although NRIC did not include region dummy variables in the regression, instead opting to use 2005 median home value, which it also used in its Updated Opex Study, we include region in our updated methodology. We tested the four census-based regions: Western (*West*), Midwest (*Midwest*), Northeast (*Northeast*) and South (*South*). We found that *Midwest* and *Northeast* were each significant in at least one regression, so we include them.

105. Use of Soil Database Information. Our source for soil data is the U.S. General Soil Map (STATSGO2) soils database. We selected STATSGO2 as a data source because it provides data for the entire country. The Soil Survey Geographic Database (SSURGO) soils data from the Natural Resource Conservation Service (NRCS) that the Nebraska Rural Independent Companies capex study used to generate soil, frost and wetland variables is an attractive database because it contains a richer set of soil variables and contains data at a smaller granular area than the STATSGO2 database. Unfortunately, as can be seen from the graph on page 23 of the NRIC comments, not only do the SSURGO data not cover Guam or American Samoa, and much of Alaska, but there are also numerous other holes in the data in many states. Thus, there are many study areas in Alaska where there is no SSURGO data and even some conterminous United States study areas such as the West Kentucky Rural Telephone Coop (Study Area Code 260421) where there is virtually no SSURGO spatial data. We therefore could not apply the results of a SSURGO-based model to these companies because the needed data would be missing. We conclude, therefore, that it is not practical to use the SSURGO data at this time.

106. Two commenters argue that we should use the SSURGO data for study areas covered by it and use STATSGO2 for the remaining study areas.[80] We have concerns about this approach for several reasons, and ultimately decline to do so. In particular, the commenters' proposed approach would mean that those study areas for which the SSURGO data are not universally available would be treated inconsistently with those for which the SSURGO are universally available. In addition, it would be challenging to combine the two data sets for those study areas where we have only some SSURGO data. Given these problems, we conclude that the implementation and fairness benefits of a nationally uniform approach based on STATS2GO outweigh the benefits of using SSURGO data for a subset of areas.[81] We discuss below the elements of the STATSGO2 data we use.

107. Independent Variables Tested But Not Used in the Model. Based on commenters' suggestions and the analysis proposed in Appendix H, we tested several additional variables that were ultimately excluded from the final model because they were not significant for either capex or opex.[82]

108. In its Capex Study, NRIC found that rain frequency increased construction cost per household.[83] Following NRIC's model, we used the Samson weather station data, and for each study

[78] *See* Alaska Rural Coalition Comments at 17-19; Copper Valley Comments at 5-7.

[79] NRIC found that cost was strongly related to region in its Original Opex Study (p 8) but did not include it in its regression, and in its Updated Opex Study used the 2005 median home values in its regression (p 3).

[80] NRIC Comments at 24 and NASUCA Comments at 46.

[81] We note that the Commission's hybrid cost proxy model, which was used to estimate forward-looking costs for the non-rural high-cost support mechanism, uses an earlier version of the STATSGO2.

[82] We include these variables in the data that we posted on the web so that others can verify our results.

[83] NRIC Capex Study at 17.

area, calculated the average number of days per year with greater than 0.5 inches of rainfall (*DaysAbvPt5*).[84] We found *DaysAbvPt5* was not significant in either regression.

109. We also tested the average slope in study areas (*slope*) using data in the STATSGO2 database.[85] Our hypothesis was that the steeper the slope, the more difficult it would be to build and maintain cabling. The coefficient on slope was insignificant (i.e., statistically indistinguishable from zero) in both regressions and therefore dropped from the model.

110. We similarly tested the percentage of the study area that was water (*PctWater*), but we did not include it in the updated model because it was insignificant in both regressions. This is unsurprising. The proposed model included *PctWater* to account for the fact that cabling may have to be run around bodies of water, but the updated model accounts for the number of road miles (as a proxy for loop length), so the additional cabling associated with routing around water has already been accounted for.

111. We tested the percentage of road miles where the water table was within 36 inches of the surface (*PctWaterTable36*).[86] We found the variable *PctWaterTable36* to be weakly significant in opex, but it had an implausible negative sign in both the capex and opex regressions. Because of the sign issue and because inclusion of the variable does not markedly improve the fit, we exclude it from the model so as not to lower the cap for study areas with high water tables.

112. Accipiter suggested adding the percentage change in loops (*PctLoopChange*) to account for study areas that are growing, because growing carriers "are prone to have unique cost structures."[87] We believe thet *PctUndepPlant* proxies for this, but out of an abundance of caution, we tested *PctLoopChange*, but found that it was insignificant, suggesting that *PctUndepPlant* is proxying for the unique cost structures that Accipiter is concerned about.[88]

113. Based on NRIC's updated opex regression, we tested statewide median house values,[89] but found them to be insignificant.[90] This is unsurprising because statewide values include mostly urban houses. Our regional independent variables, however, helped capture the intended effect.

114. We also tested the natural log of the number of stream crossings (*LnStreamCross*), which could increase construction costs in the same way that road crossings do. We found *LnStreamCross* to be significant and negative in opex, but insignificant in capex. Because the coefficient was an implausible sign in the opex regression without an offsetting plausible coefficient in the other regressions, we omitted

[84] For those study areas with one station, the value (for the number of days per year with greater than 0.5 inches of rainfall) for that station was used. For those study areas with more than one station, the average of the values was used. For those study areas without a station, the nearest station was used. For those study areas that were non-conterminous, each polygon (i.e., piece) of the study area was treated as its own study area (for calculating the rainfall statistic), and then the weighted mean value across all the study area's polygons was calculated using the polygon's square miles as the weight.

[85] We calculated the average of the absolute value of slope along the road segments in the study area.

[86] The locations of close-to-the-surface water table within 36 inches of the surface come from the STATSGO2 database.

[87] Accipiter Comments at 23-24.

[88] We calculated *PctLoopChange* as the percentage change of DL060 loop count between 2009 and 2010. For the observations that converted from being average schedule to cost companies (and therefore we did not have DL060 loop counts for the prior year), we instead used the percentage change in DL070 loops, which we believe is an excellent proxy for the percentage change in DL060 loops.

[89] NRIC's intent in including house values was to proxy for local "cost of living differences." NRIC Updated Opex Study at 3.

[90] See http://www.census.gov/hhes/www/housing/census/historic/values.html

LnStreamCross from both regressions.[91]

115. The proposed model also included the number of census blocks in the study area.[92] Although the natural log of the total number of census blocks (*LnBlocks*) was weakly significant in the opex regression, it was not significant in the capex regression. Although we generally included variables that were significant in at least one regression in both regressions, we omitted census blocks from the updated model regressions for two reasons. First, commenters did not think that the number of blocks was a good proxy for density.[93] Also, we are now accounting for customer dispersion and density directly through independent variables *LnRoadMiles*, *LnRoadCrossings* and *LnDensity*.

116. Unavailable Independent Variables. Several carriers suggested additional variables to the regression analysis, but we were unable to include them because the data were either unavailable to the Commission, nonpublic, or we could not generate data at the study area level. We recognize that some of the unavailable variables could be significant if they could be included, but given the other enhancements made to the regressions described herein, we conclude that the methodology is adequate to identify cost outliers among similarly situated companies.

117. The NRIC capex study postulated that the presence of wetlands would increase construction costs because of need for additional "approvals and specialized techniques."[94] It found that wetlands were positively correlated with increased predicted construction costs. As NRIC points out, however, wetlands data are not available for Colorado, Wisconsin and Montana. Since our objective is to develop a methodology that applies equally to all cost carriers, we could not include wetlands data in the updated methodology.[95]

118. Similarly, commenters suggested the following additional variables that, if not already proxied in the model, could not be used because they were unavailable to the Commission, nonpublic, or data could not be generated at the study area level: age of investment;[96] broadband speed capability;[97] cable route miles or cable sheath miles;[98] status as carrier of last resort;[99] copper versus fiber networks;[100]

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[91] U.S. Department of the Interior, U.S. Geological Survey, National Hydrography Dataset, last visited Feb. 1, 2012, *available at* http://nhd.usgs.gov/index.html. As we did with road crossings data, we intersected stream data with roads to find the number of stream crossings in the study area.

[92] *USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 182, App. H, para 24. In the proposed methodology, the number of blocks was broken out by whether they were in urbanized areas, urbanized clusters or nonurban (rural) areas.

[93] Accipiter Comments at 25-26, Moss Adams at 12.

[94] NRIC Capex study at 10.

[95] In its Capex Study, NRIC uses SSURGO data to create proxies for wetlands data where it does not exist, but because SSURGO data does not cover the entire country and we are therefore not able to use it, we could not create that proxy.

[96] Interbel Comments at 10. Study areas submit a variety of information on plant, but we cannot calculate the age of investment from it. Investment age, however, is proxied by *PctUndepPlant*.

[97] Guadalupe Comments at 3. While the Bureau has access to carriers' FCC Form 477 filings, which contain broadband speed information for each filer, many carriers file their Form 477 at the holding company level within a state rather than at the study area code level, so matching up the Form 477 filings with the study area code would be challenging in some cases. Additionally, the data are nonpublic, and therefore they could not be published for others trying to replicate the regression results.

[98] Guadalupe Comments at 3. Some, but not all, rate-of-return cost carriers report this information to RUS, but there is no universally-available source of cable sheath or route miles. Cable mileage is proxied by *LnRoadMiles*.

[99] Guadalupe Comments at 5 and Washington Independent Tel comments at 5. We do not have a source for which states require study areas to be carriers of last resort. Further, the obligations imposed on a carrier of last resort can vary by state.

cost of living and labor costs;[101] environmental; legal and regulatory costs;[102] loop length/average loop length;[103] right of way costs and vacant lots;[104] and weather patterns.[105]

119. One commenter argues that the Bureau's methodology should include variables that are not universally available and that it is better to comprehensively study a representative sample of study areas and apply the results to the wider population of study areas.[106] The commenter does not specify, however, how the Bureau could apply that knowledge to study areas for which the information is unavailable.

Implementation. For each study area, the regressions will be used to generate the 90th percentile predicted values for both the natural log of capex and the natural log of opex. These values will then be converted back to "levels" by using the inverse of the natural log function.

The lower of the study area's original algorithm step 25A and the level of the predicted 90th percentile capex value will be retained in algorithm step 25A. Similarly, the lower of the study area's original algorithm step 25B and level of the predicted 90th percentile opex value will be retained in algorithm step 25B. These values will then be summed in algorithm step 25C, which will feed into algorithm step 26.

(...continued from previous page)

[100] Carriers for Progress Comments at 7. We are unaware of a source for this information.

[101] Guadalupe and Moss Adams suggested labor costs. Guadalupe Comments at 3; Moss Adams Comments at 8. We do not have cost of living or labor rate data with sufficient geographic granularity to create a meaningful index. We note that cost of living and labor rates in rural areas may be less than in urban areas, so we expect that statewide data would not be helpful. We tested this assumption by including statewide median house values in the regression, but the variable was not significant. Our regressions instead use regional variables to proxy for such variations in labor costs.

[102] Carriers for Progress Comments at 8. We are not aware of a direct source for such information; instead, we use the regional, *PctParkLand* and *PctTribalLand* variables to proxy for such costs. We considered using dummy variables for individual states, but that would significantly benefit the study areas in those states that had few study areas in the regression, because any inefficiency of that carrier would be picked up by the dummy variable.

[103] Central Tex Comments at 7, Midvale Tel Comments at 5, and Washington Independent Tel Comments at 3. Some, but not all, rate-of-return cost carriers report this information to RUS, but there is no universally available source of average loop length. Our regressions use *LnRoadMiles* to proxy for loop length.

[104] Guadalupe Valley Comments at 3. We are unaware of sources of data for these variables. Our *PctParkLand* and *PctTribalLand* variables proxy for right-of-way costs.

[105] Moss Adams Comments at 12. Because weather covers so many things, such as wind, temperature, rainfall and other attributes, we could not address such a vague suggestion. Above, we discuss the weather features that we include in the updated methodology: temperature and rainfall.

[106] NRIC Comments at 19-20.

Table 1

Descriptive Statistics For The Raw Data

Variable	N	Mean	Std Dev.	Min	10th Pctile	Median	90th Pctile	Max
LnCapex	726	13.78	1.27	9.01	12.15	13.83	15.41	16.93
LnOpex	726	14.11	1.03	10.29	12.75	14.16	15.38	17.03
LnLoops	726	7.81	1.20	3.00	6.33	7.88	9.28	11.18
LnRoadMiles	726	6.55	1.34	1.88	4.86	6.45	8.43	10.53
LnRoadCrossings	726	8.00	1.23	4.64	6.42	7.94	9.64	11.46
LnStateSACs	726	0.36	0.63	0.00	0.00	0.00	1.39	3.04
PctUndepPlant	726	33.85	14.81	-6.26	16.87	31.96	53.36	88.63
LnDensity	726	2.01	1.59	-4.27	-0.10	2.23	3.73	7.02
LnExchanges	726	1.18	0.98	0.00	0.00	1.10	2.48	4.33
PctBedrock36	726	0.06	0.14	0.00	0.00	0.00	0.22	0.89
Difficulty	726	1.06	0.19	1.00	1.00	1.00	1.16	2.81
Climate	726	6.20	1.59	1.67	4.37	6.00	8.46	12.65
PctTribalLand	726	9.03	24.81	0.00	0.00	0.00	28.11	100.00
PctParkLand	726	0.64	3.86	0.00	0.00	0.00	0.02	47.81
PctUrban	726	9.17	19.46	0.00	0.00	0.00	37.40	95.38
Alaska	726	0.02	0.15	0.00	0.00	0.00	0.00	1.00
Midwest	726	0.41	0.49	0.00	0.00	0.00	1.00	1.00
Northeast	726	0.08	0.27	0.00	0.00	0.00	0.00	1.00

Table 2

Correlation Coefficients

Variable	Ln Opex	Ln Capex	Ln Loops	LnRoad Miles	LnRoad Crossings	LnState SACs	PctUnDep Plant	Ln Density	Ln Exhanges	Pct Bedrock36	Difficulty	Climate	Pct TribalLand	Pct ParkLand	Pct Urban	Alaska	Midwest	Northeast
LnOpex	1.00	0.88	0.87	0.58	0.70	-0.12	0.04	0.13	0.60	0.05	0.11	0.25	0.08	0.04	0.28	0.03	-0.19	-0.10
LnCapex	0.88	1.00	0.80	0.59	0.69	-0.14	0.32	0.09	0.60	0.06	0.11	0.15	0.05	0.02	0.23	-0.03	-0.08	-0.17
LnLoops	0.87	0.80	1.00	0.52	0.67	0.03	-0.13	0.34	0.58	-0.05	0.08	0.14	0.00	-0.02	0.35	-0.03	-0.13	0.04
LnRoadMiles	0.58	0.59	0.52	1.00	0.94	-0.13	-0.01	-0.51	0.79	0.07	0.13	-0.05	0.04	0.06	-0.06	-0.02	-0.13	-0.22
LnRoadCrossings	0.70	0.69	0.67	0.94	1.00	-0.12	-0.04	-0.26	0.76	0.06	0.14	0.09	0.03	-0.02	0.10	-0.10	-0.15	-0.21
LnStateSACs	-0.12	-0.14	0.03	-0.13	-0.12	1.00	-0.26	0.16	-0.08	-0.05	0.05	-0.17	-0.07	-0.01	0.05	-0.04	0.12	0.13
PctUnDepPlant	0.04	0.32	-0.13	-0.01	-0.04	-0.26	1.00	-0.10	-0.04	0.08	-0.01	-0.07	0.01	0.01	-0.02	0.00	0.15	-0.19
LnDensity	0.13	0.09	0.34	-0.51	-0.26	0.16	-0.10	1.00	-0.32	-0.15	-0.05	0.26	-0.12	-0.26	0.39	-0.38	0.06	0.25
LnExchanges	0.60	0.60	0.58	0.79	0.76	-0.08	-0.04	-0.32	1.00	-0.01	0.11	-0.11	0.11	0.08	-0.09	0.09	0.00	-0.09
PctBedrock36	0.05	0.06	-0.05	0.07	0.06	-0.05	0.08	-0.15	-0.01	1.00	0.13	0.17	0.17	0.12	-0.01	0.07	-0.22	-0.02
Difficulty	0.11	0.11	0.08	0.13	0.14	0.05	-0.01	-0.05	0.11	0.13	1.00	0.11	0.19	-0.01	-0.01	-0.05	-0.10	-0.08
Climate	0.25	0.15	0.14	-0.05	0.09	-0.17	-0.07	0.26	-0.11	0.17	0.11	1.00	0.06	-0.09	0.22	-0.22	-0.53	-0.18
PctTribalLand	0.08	0.05	0.00	0.04	0.03	-0.07	0.01	-0.12	0.11	0.17	0.19	0.06	1.00	0.04	-0.02	0.16	-0.18	-0.10
PctParkLand	0.04	0.02	-0.02	0.06	-0.02	-0.01	0.01	-0.26	0.08	0.12	-0.01	-0.09	0.04	1.00	0.00	0.44	-0.12	0.00
PctUrban	0.28	0.23	0.35	-0.06	0.10	0.05	-0.02	0.39	-0.09	-0.01	-0.01	0.22	-0.02	0.00	1.00	0.01	-0.05	-0.01
Alaska	0.03	-0.03	-0.03	-0.02	-0.10	-0.04	0.00	-0.38	0.09	0.07	-0.05	-0.22	0.16	0.44	0.01	1.00	-0.13	-0.05
Midwest	-0.19	-0.08	-0.13	-0.13	-0.15	0.12	0.15	0.06	0.00	-0.22	-0.10	-0.53	-0.18	-0.12	-0.05	-0.13	1.00	-0.24
Northeast	-0.10	-0.17	0.04	-0.22	-0.21	0.13	-0.19	0.25	-0.09	-0.02	-0.08	-0.18	-0.10	0.00	-0.01	-0.05	-0.24	1.00

Table 3
Capex (LnCapex) Regression

Variable	Coef.	Std. Err.	t	P>|t|	
LnLoops	0.788	0.071	11.15	0.00	*
LnRoadMiles	-0.208	0.136	-1.53	0.13	
LnRoadCrossings	0.240	0.091	2.64	0.01	*
LnStateSACs	-0.070	0.043	-1.65	0.10	*
PctUndepPlant	0.031	0.002	18.39	0.00	*
LnDensity	-0.158	0.072	-2.20	0.03	*
LnExchanges	0.118	0.061	1.94	0.05	*
PctBedrock36	-0.072	0.156	-0.46	0.64	
Difficulty	0.118	0.087	1.36	0.17	
Climate	0.089	0.030	2.99	0.00	*
PctTribalLand	0.0005	0.001	0.47	0.64	
PctParkLand	0.018	0.005	3.71	0.00	*
PctUrban	0.001	0.002	0.34	0.73	
Alaska	-0.6223	0.337	-1.85	0.07	*
Midwest	0.092	0.091	1.01	0.31	
Northeast	-0.309	0.124	-2.49	0.01	*
Constant	6.039	0.416	14.51	0.00	*

N = 726 Pseudo R^2 = .6684

Notes:

An * indicates significance at the 0.10 level.

P-values are based on Wald statistics.

Values are rounded. More precise coefficient values are posted at http://www.fcc.gov/encyclopedia/rate-return-resources.

Table 3 (contd.)

Opex (LnOpex) Regression

Variable	Coef.	Std. Err.	t	P>|t|	
LnLoops	0.596	0.037	15.97	0.00	*
LnRoadMiles	-0.247	0.086	-2.87	0.00	*
LnRoadCrossings	0.272	0.081	3.37	0.00	*
LnStateSACs	-0.078	0.035	-2.22	0.03	*
PctUndepPlant	0.008	0.001	6.47	0.00	*
LnDensity	-0.128	0.034	-3.72	0.00	*
LnExchanges	0.125	0.032	3.94	0.00	*
PctBedrock36	0.279	0.098	2.84	0.01	*
Difficulty	0.114	0.057	2.02	0.04	*
Climate	0.135	0.020	6.91	0.00	*
PctTribalLand	0.002	0.001	2.79	0.01	*
PctParkLand	0.006	0.004	1.65	0.10	*
PctUrban	0.002	0.001	2.52	0.01	*
Alaska	0.299	0.155	1.92	0.06	*
Midwest	0.134	0.063	2.13	0.03	*
Northeast	0.015	0.085	0.18	0.86	
Constant	8.198	0.255	32.21	0.00	*

N = 726 Pseudo R^2 = 0.6234

Notes:

An * indicates significance at the 0.10 level.

P-values are based on Wald statistics.

Values are rounded. More precise coefficient values are posted at http://www.fcc.gov/encyclopedia/rate-return-resources.

Figure 1

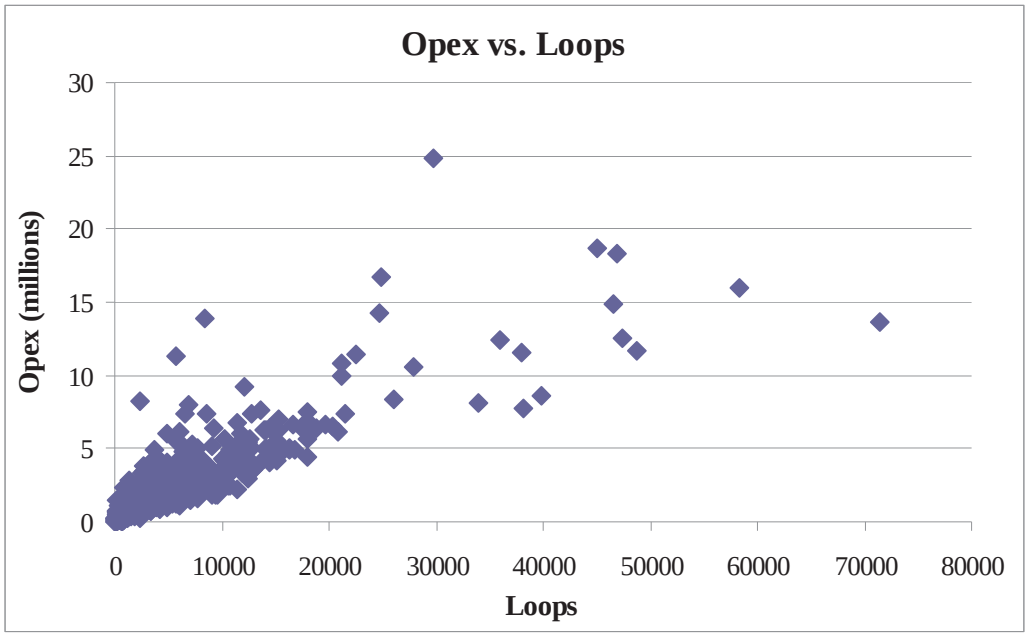


Figure 2

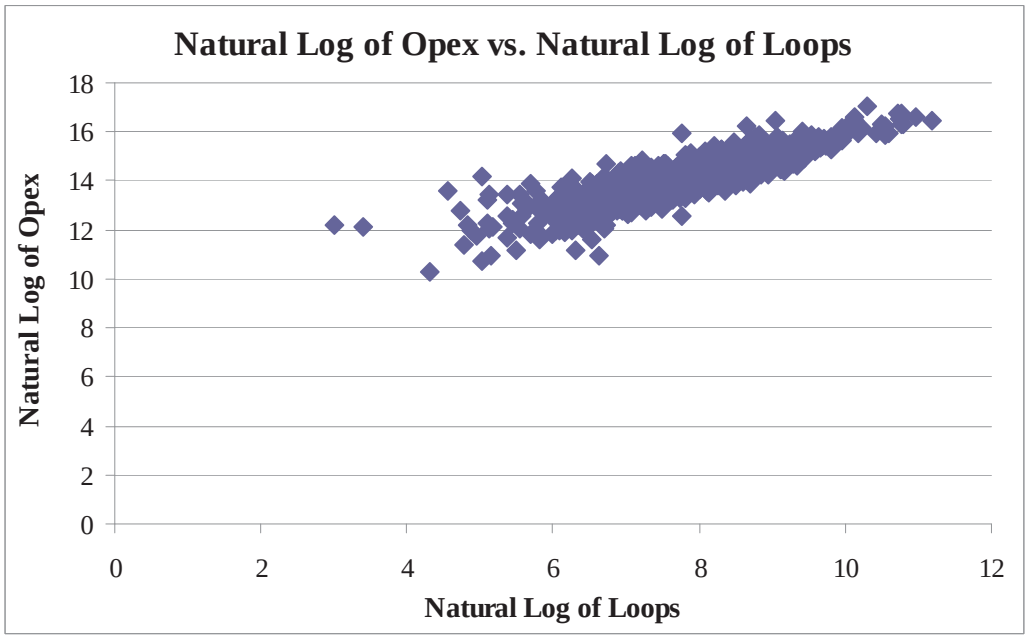


Figure 3

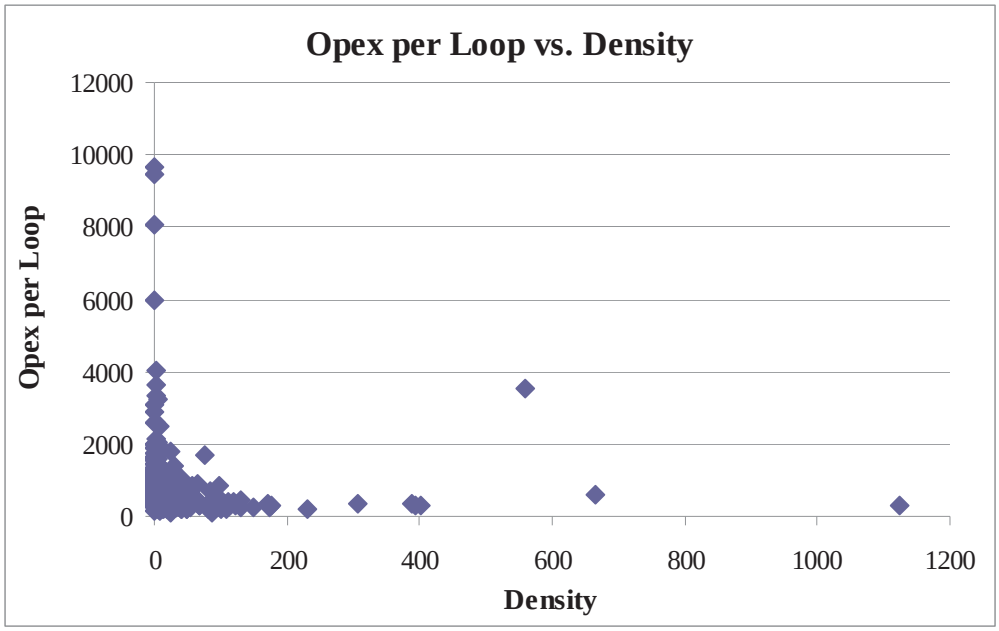
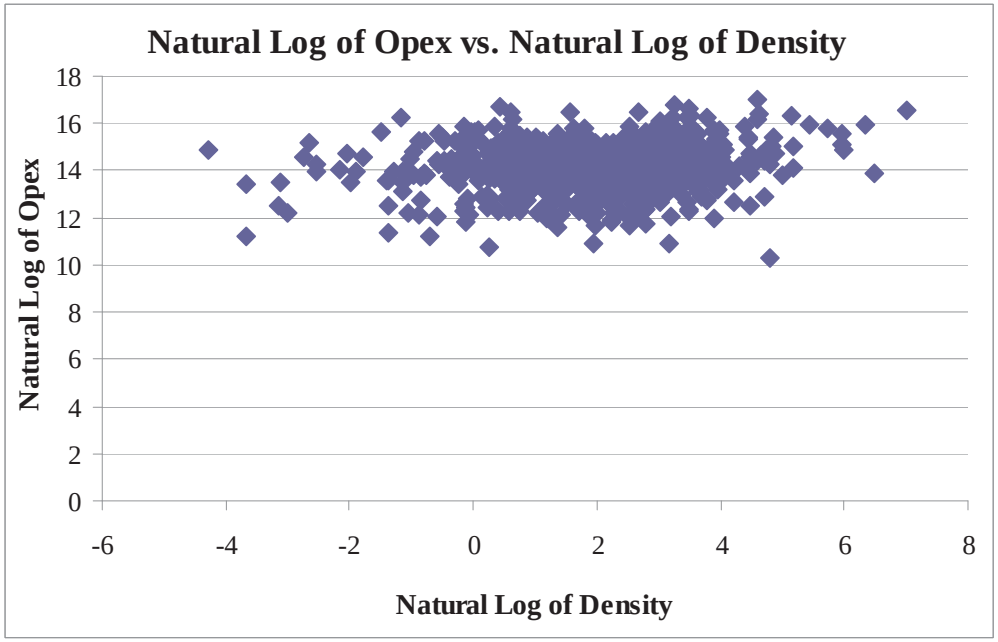


Figure 4



APPENDIX B

Quantile Regression Cost Per Loop (CPL)

Study Area Name	SAC	State	Loops	Current CPL	Current Capex CPL	90% Capex CPL Estimate	Current Opex CPL	90% Opex CPL Estimate	CPL used to Determine Support
3-RIVERS TEL COOP	482255	MT	17,970	$905	$490	$536	$416	$426	$905
ACCIPITER DBA ZONA	452191	AZ	520	$6,707	$4,134	$3,810	$2,574	$3,202	$6,383
ACE TEL ASSN-IA	351346	IA	3,997	$534	$225	$386	$308	$631	$534
ACE TEL ASSN-MN	361346	MN	9,833	$688	$350	$913	$338	$590	$688
ACE TEL OF MICHIGAN	310704	MI	4,370	$673	$303	$591	$369	$583	$673
ADAK TEL UTILITY	610989	AK	147	$12,739	$3,265	$3,265	$9,474	$9,474	$12,739
AGATE MUTUAL TEL CO	462178	CO	113	$4,530	$1,457	$4,109	$3,073	$3,549	$4,530
ALASKA TEL CO	613017	AK	3,737	$815	$262	$630	$552	$1,415	$815
ALBANY MUTUAL ASSN	361347	MN	3,336	$825	$490	$944	$335	$630	$825
ALBION TEL CO-ATC	472213	ID	3,853	$1,374	$537	$881	$837	$889	$1,374
ALENCO COMMUNICATION	442090	TX	1,888	$2,129	$881	$1,345	$1,248	$1,893	$2,129
ALHAMBRA-GRANTFORK	340978	IL	1,042	$657	$270	$593	$387	$1,070	$657
ALL WEST COMM.-WY	512290	WY	293	$906	$437	$823	$468	$1,584	$906
ALL WEST COMM-UT	502288	UT	4,572	$783	$457	$454	$326	$525	$780
ALLBAND COMM COOP	310542	MI	163	$8,283	$4,945	$5,972	$3,338	$3,338	$8,283
ALLENDALE TEL CO	310669	MI	3,842	$558	$294	$310	$265	$531	$558
ALLIANCE-SPLITROCK	391657	SD	7,212	$785	$504	$744	$280	$539	$785
ALMA COMM. CO.	421860	MO	342	$2,186	$1,093	$2,280	$1,093	$2,141	$2,186
ALMA TEL CO	220344	GA	6,090	$426	$84	$337	$342	$678	$426
ALPINE COMM.	351106	IA	5,168	$630	$313	$505	$317	$576	$630
AMELIA TEL CORP	190217	VA	5,095	$533	$226	$253	$307	$389	$533
AMERICAN SAMOA	673900	AS	9,884	$410	$161	$933	$249	$1,728	$410
ARAPAHOE TEL CO	371516	NE	1,989	$1,102	$379	$637	$723	$1,028	$1,102
ARCTIC SLOPE TEL	613001	AK	2,518	$1,417	$341	$341	$1,076	$877	$1,218
ARDMORE TEL CO	290280	TN	7,745	$434	$234	$307	$199	$495	$434
ARIZONA TELEPHONE CO	452171	AZ	2,967	$622	$296	$642	$326	$1,257	$622
ARKANSAS TEL CO	401692	AR	6,938	$379	$160	$335	$219	$547	$379

Study Area Name	SAC	State	Loops	Current CPL	Current Capex CPL	90% Capex CPL Estimate	Current Opex CPL	90% Opex CPL Estimate	CPL used to Determine Support
ARKWEST COMM., INC.	401734	AR	4,384	$972	$392	$581	$580	$813	$972
ARLINGTON TEL CO	371517	NE	927	$805	$250	$395	$555	$770	$805
ARMSTRONG OF WV	200256	WV	2,702	$632	$174	$381	$457	$565	$632
ARMSTRONG TEL CO-NY	150071	NY	2,800	$754	$240	$308	$515	$601	$754
ARMSTRONG TEL CO-PA	170189	PA	1,441	$973	$351	$261	$622	$665	$882
ARMSTRONG TEL OF MD	180216	MD	5,905	$546	$174	$281	$371	$469	$546
ARMSTRONG TEL. CO.	200267	WV	4,423	$748	$266	$422	$482	$573	$748
ARROWHEAD COMM CORP	361374	MN	569	$668	$311	$311	$357	$857	$668
ARVIG TEL CO	361350	MN	11,482	$526	$193	$304	$333	$312	$505
ASOTIN TEL - OR	532404	OR	120	$901	$160	$712	$740	$2,639	$901
ASOTIN TEL - WA	522404	WA	1,157	$729	$379	$547	$350	$1,014	$729
ATLANTIC MEMBERSHIP	230468	NC	37,985	$390	$186	$480	$204	$373	$390
ATLAS TEL CO	431966	OK	1,147	$864	$305	$574	$559	$1,311	$864
AYRSHIRE FARMERS MUT	351105	IA	254	$1,353	$676	$1,015	$677	$1,910	$1,353
BACA VALLEY TEL CO	492259	NM	662	$2,959	$1,381	$1,308	$1,577	$1,920	$2,885
BADGER TELECOM, INC.	330844	WI	5,275	$584	$229	$245	$356	$344	$573
BALLARD RURAL COOP	260396	KY	5,273	$756	$421	$759	$334	$747	$756
BARNARDSVILLE TEL CO	230469	NC	1,094	$772	$346	$411	$426	$748	$772
BAY SPRINGS TEL CO	280446	MS	9,000	$992	$415	$463	$577	$632	$992
BEAR LAKE COMM	503032	UT	784	$906	$283	$400	$623	$782	$906
BEAVER CREEK COOP	532359	OR	3,652	$614	$220	$505	$394	$728	$614
BEEHIVE TEL CO - NV	552284	NV	124	$2,615	$992	$1,832	$1,623	$4,061	$2,615
BEEHIVE TEL CO - UT	502284	UT	930	$3,026	$1,797	$2,969	$1,228	$2,554	$3,026
BEK COMM. COOP.	381604	ND	6,381	$1,337	$933	$1,206	$403	$784	$1,337
BENKELMAN TEL CO	372455	NE	1,175	$1,717	$753	$755	$964	$1,056	$1,717
BERNARD TEL CO INC	351110	IA	472	$1,380	$680	$1,049	$700	$1,416	$1,380
BETTLES TEL CO INC	613002	AK	208	$447	$156	$306	$290	$1,542	$447
BIG BEND TEL CO INC	442039	TX	5,602	$3,648	$1,643	$1,920	$2,006	$2,006	$3,648
BIJOU TEL COOP ASSOC	462181	CO	1,151	$1,289	$441	$1,064	$847	$1,055	$1,289
BIXBY TEL CO	431969	OK	6,908	$1,145	$447	$451	$698	$698	$1,145
BLACK EARTH TEL CO	330849	WI	1,168	$707	$293	$466	$414	$692	$707

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BLACKFOOT TEL - BTC	482235	MT	6,765	$989	$485	$826	$504	$631	$989
BLACKFOOT TEL - CFT	483308	MT	8,084	$806	$417	$841	$389	$609	$806
BLANCA TEL CO	462182	CO	986	$2,675	$1,043	$1,320	$1,632	$1,304	$2,347
BLOOMER TEL CO	330850	WI	2,950	$840	$522	$553	$318	$593	$840
BLOOMINGDALE HOME	320742	IN	498	$1,433	$206	$902	$1,227	$1,337	$1,433
BLOOMINGDALE TEL CO	310679	MI	1,524	$720	$215	$377	$505	$687	$720
BLOSSOM TEL CO	442038	TX	984	$1,304	$671	$581	$633	$1,143	$1,214
BLOUNTSVILLE TEL CO	250282	AL	3,104	$626	$192	$245	$434	$546	$626
BLUE EARTH VALLEY	361358	MN	5,604	$600	$196	$431	$404	$525	$600
BLUE RIDGE TEL CO	220346	GA	10,315	$772	$364	$480	$408	$478	$772
BLUE VALLEY TELE-COM	411746	KS	2,662	$3,417	$1,999	$1,512	$1,419	$1,203	$2,714
BLUFFTON TEL. CO.	240512	SC	21,067	$884	$373	$663	$511	$466	$839
BORDER TO BORDER	442073	TX	96	$15,868	$7,813	$5,207	$8,055	$6,972	$12,179
BPS Tel. Co.	420463	MO	2,919	$671	$244	$787	$427	$1,063	$671
BRANTLEY TEL CO	220347	GA	4,793	$1,306	$672	$940	$634	$914	$1,306
BRAZORIA TEL CO	442040	TX	4,600	$1,243	$627	$627	$616	$916	$1,243
BRAZOS TEL COOP INC	442041	TX	4,599	$708	$192	$731	$515	$1,160	$708
BRETTON WOODS TEL CO	120038	NH	643	$558	$148	$319	$410	$872	$558
BRIDGEWATER TEL CO	361362	MN	5,834	$814	$393	$393	$420	$421	$814
BRISTOL BAY TEL COOP	613003	AK	1,543	$1,269	$348	$636	$921	$2,047	$1,269
BRUCE TEL CO - MS	280447	MS	2,321	$859	$323	$391	$536	$791	$859
BRUCE TEL CO, INC	330855	WI	1,420	$464	$216	$328	$248	$614	$464
BUGGS ISLAND COOP	190219	VA	3,989	$518	$244	$428	$274	$633	$518
BULLOCH COUNTY RURAL	220348	GA	8,941	$748	$490	$625	$258	$657	$748
BUSH-TEL INC.	613004	AK	956	$1,052	$295	$387	$756	$1,429	$1,052
BUTLER TEL CO	250284	AL	6,549	$552	$214	$329	$338	$601	$552
CALAVERAS TEL CO	542301	CA	3,929	$1,360	$609	$731	$751	$1,020	$1,360
CALHOUN CITY TEL CO	280448	MS	2,839	$407	$59	$240	$348	$678	$407
CAL-ORE TELEPHONE CO	542311	CA	2,139	$1,021	$379	$785	$642	$1,112	$1,021
CAMBRIDGE TEL CO	472215	ID	1,788	$1,277	$752	$1,184	$525	$1,164	$1,277
CAMBRIDGE TEL CO -NE	371526	NE	1,148	$1,611	$630	$1,820	$981	$1,397	$1,611

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CAMDEN TEL & TEL CO	220351	GA	17,840	$480	$232	$354	$248	$454	$480
CAMERON TEL CO - LA	270425	LA	5,440	$1,457	$481	$574	$976	$976	$1,457
CAMERON TEL CO TEXAS	440425	TX	608	$1,196	$353	$705	$844	$1,840	$1,196
CAMPTI-PLEASANT HILL	270426	LA	2,058	$1,012	$367	$537	$645	$1,065	$1,012
CANADIAN VALLEY TEL	431974	OK	1,120	$1,359	$489	$579	$870	$1,390	$1,359
CANBY TEL ASSN	532362	OR	9,571	$514	$217	$431	$297	$534	$514
CAP ROCK TEL COOP	442046	TX	4,396	$786	$309	$1,121	$477	$1,317	$786
CARNEGIE TEL CO INC	431976	OK	1,268	$1,075	$323	$663	$752	$1,311	$1,075
CARR TEL CO	310683	MI	1,342	$630	$228	$547	$402	$821	$630
CASCADE UTIL INC	532371	OR	7,753	$614	$261	$656	$353	$717	$614
CASS TEL CO	340984	IL	2,061	$744	$120	$559	$624	$931	$744
CENTRAL ARKANSAS TEL	401697	AR	2,602	$931	$394	$456	$538	$738	$931
CENTRAL MONTANA	483310	MT	7,317	$1,289	$729	$944	$560	$603	$1,289
CENTRAL OKLAHOMA TEL	431977	OK	2,372	$1,616	$879	$1,097	$736	$1,385	$1,616
CENTRAL STATE TEL CO	330859	WI	8,371	$586	$244	$271	$342	$342	$586
CENTRAL TEXAS CO-OP	442052	TX	6,562	$1,471	$991	$695	$480	$1,063	$1,175
CENTRAL UTAH TEL INC	502277	UT	1,615	$846	$383	$809	$463	$981	$846
CHAMPLAIN TEL CO	150077	NY	4,227	$563	$130	$266	$433	$438	$563
CHARITON VALLEY TEL	421864	MO	6,415	$1,999	$855	$1,326	$1,144	$928	$1,783
CHATHAM TEL CO - MI	310685	MI	2,363	$604	$249	$422	$355	$668	$604
CHAZY & WESTPORT	150079	NY	2,959	$504	$207	$239	$297	$507	$504
CHEQUAMEGON COM COOP	330860	WI	8,914	$1,044	$625	$755	$419	$570	$1,044
CHEROKEE TEL CO	431979	OK	3,829	$760	$355	$965	$405	$1,222	$760
CHEYENNE RIVER SIOUX	391647	SD	3,053	$1,097	$590	$1,348	$507	$1,332	$1,097
CHIBARDUN TEL COOP	330861	WI	4,660	$1,277	$867	$709	$410	$588	$1,119
CHICKAMAUGA TEL CORP	220354	GA	5,106	$640	$288	$391	$352	$624	$640
CHICKASAW TEL CO	431980	OK	6,753	$1,518	$342	$610	$1,176	$962	$1,305
CHRISTENSEN COMM CO	361425	MN	1,300	$501	$97	$323	$404	$683	$501
CHUGWATER TEL CO	512289	WY	166	$1,254	$223	$803	$1,030	$1,929	$1,254
CHURCHILL-CC COMM.	552349	NV	10,295	$873	$437	$1,099	$436	$789	$873
CIMARRON TEL CO	431982	OK	6,538	$1,078	$438	$639	$640	$953	$1,078

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CITIZENS HAMMOND NY	150081	NY	1,133	$1,093	$428	$428	$665	$870	$1,093
CITIZENS MUTUAL TEL	351129	IA	3,382	$959	$594	$950	$365	$851	$959
CITIZENS TEL CO	230473	NC	17,455	$703	$335	$392	$368	$378	$703
CITIZENS TEL CO - GA	220355	GA	3,574	$586	$162	$377	$424	$818	$586
CITIZENS TEL CO - MO	421865	MO	3,492	$840	$291	$844	$549	$861	$840
CITIZENS TEL COOP-WI	330863	WI	1,988	$1,383	$810	$943	$573	$755	$1,383
CLARA CITY TEL EXCH	361370	MN	1,349	$622	$186	$380	$435	$683	$622
CLARENCE TEL CO	351130	IA	641	$1,559	$1,121	$1,641	$438	$1,356	$1,559
CLARKS TELECOM CO.	371531	NE	716	$2,064	$1,304	$3,644	$760	$1,929	$2,064
CLAY DBA ENDEAVOR	320753	IN	10,136	$940	$519	$915	$421	$596	$940
CLEAR CREEK MUTUAL	532363	OR	2,930	$730	$244	$469	$487	$769	$730
CLEAR LAKE INDEPEND	351132	IA	4,883	$897	$458	$417	$439	$538	$856
CLEVELAND COUNTY TEL	401698	AR	2,702	$602	$225	$353	$378	$768	$602
COCHRANE COOP TEL CO	330866	WI	1,019	$2,018	$1,277	$2,011	$741	$1,327	$2,018
COLEMAN COUNTY CO-OP	442057	TX	1,896	$1,730	$911	$1,421	$818	$1,784	$1,730
COLO TEL CO	351134	IA	594	$1,878	$1,311	$1,420	$567	$1,340	$1,878
COLORADO VALLEY TEL	442059	TX	6,286	$946	$483	$550	$464	$839	$946
COLTON TEL CO	532364	OR	1,013	$1,367	$497	$953	$870	$1,245	$1,367
COLUMBUS TELEPHONE	411756	KS	1,793	$1,156	$545	$729	$611	$1,105	$1,156
COMM 1 NETWORK	351262	IA	535	$1,642	$1,079	$1,653	$563	$1,587	$1,642
COMM CORP OF INDIANA	320776	IN	9,644	$548	$261	$276	$287	$357	$548
COMM CORP OF MI	310672	MI	3,424	$498	$201	$294	$296	$528	$498
COMMUNITY TEL CO	442061	TX	1,470	$1,063	$276	$863	$788	$1,533	$1,063
COMSOUTH TELECOMM	220369	GA	4,075	$638	$212	$389	$426	$725	$638
CONCORD TEL EXCHANGE	290559	TN	14,991	$819	$451	$279	$368	$347	$626
CONNEAUT TEL CO	300606	OH	5,066	$745	$434	$478	$311	$647	$745
CONSOLIDATED TEL CO	371532	NE	2,576	$1,484	$502	$983	$983	$1,074	$1,484
CONSOLIDATED TELCOM	381607	ND	7,103	$1,312	$756	$1,041	$556	$788	$1,312
CONSOLIDATED TELECOM	371562	NE	940	$1,244	$344	$1,463	$900	$1,367	$1,244
CONTINENTAL OF OHIO	300607	OH	2,092	$385	$110	$273	$275	$634	$385
COOP TEL EXCHANGE	351303	IA	613	$1,442	$910	$1,864	$533	$1,546	$1,442

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COPPER VALLEY TEL	613006	AK	4,538	$2,876	$1,627	$1,627	$1,250	$1,250	$2,876
CORDOVA TEL COOP	613007	AK	1,711	$1,821	$822	$896	$999	$2,345	$1,821
COUNCIL GROVE TEL CO	411758	KS	1,835	$2,352	$1,561	$2,079	$791	$1,175	$2,352
COZAD TEL CO	371534	NE	1,893	$1,268	$405	$432	$863	$808	$1,213
CRAW-KAN TEL COOP	411818	KS	11,291	$913	$530	$647	$382	$726	$913
CROCKETT TEL CO	290561	TN	3,191	$517	$213	$362	$304	$619	$517
CROSS TEL CO	431985	OK	7,613	$1,088	$425	$425	$664	$765	$1,088
CROWN POINT TEL CORP	150085	NY	827	$1,080	$344	$370	$736	$800	$1,080
CUMBY TEL COOP INC	442065	TX	736	$903	$305	$701	$598	$1,301	$903
CUNNINGHAM TEL CO	411761	KS	1,085	$2,279	$1,251	$1,371	$1,029	$1,652	$2,279
CURTIS TEL CO	371536	NE	593	$1,418	$464	$533	$953	$989	$1,418
CUSTER TEL COOP	472218	ID	2,312	$1,676	$1,004	$902	$672	$903	$1,574
DAKOTA CENTRAL COOP	381610	ND	4,187	$1,231	$712	$1,112	$520	$840	$1,231
DALTON TEL CO, INC	371537	NE	903	$1,626	$780	$719	$847	$1,258	$1,566
DARIEN TEL CO	220358	GA	4,878	$1,191	$411	$584	$780	$836	$1,191
DAVIESS-MARTIN/RTC	320759	IN	3,063	$1,300	$711	$1,074	$589	$941	$1,300
DECATUR TEL CO INC	401699	AR	884	$557	$203	$371	$355	$1,015	$557
DEERFIELD FARMERS	310691	MI	1,907	$1,137	$309	$452	$829	$754	$1,063
DEKALB TEL COOP	290562	TN	16,778	$526	$233	$535	$293	$517	$526
DELHI TEL CO	150088	NY	3,693	$712	$330	$386	$382	$454	$712
DELL TEL CO-OP - NM	492066	NM	497	$2,658	$1,196	$1,464	$1,462	$3,116	$2,658
DELL TEL. CO-OP - TX	442066	TX	794	$6,594	$3,729	$2,162	$2,864	$2,837	$4,999
DELTA COUNTY TEL CO	462184	CO	8,467	$499	$214	$392	$284	$491	$499
DELTA TEL CO	280452	MS	3,180	$816	$186	$496	$630	$881	$816
DEPOSIT TEL CO	150089	NY	6,775	$397	$122	$200	$275	$356	$397
DICKEY RURAL COOP	381611	ND	7,707	$1,136	$632	$1,215	$503	$762	$1,136
DILLER TEL CO	371540	NE	795	$1,932	$663	$1,065	$1,269	$1,466	$1,932
DIRECT COMM-ROCKLAND	472232	ID	1,068	$1,319	$602	$827	$717	$1,181	$1,319
DIRECTCOMM-CEDAR VAL	500758	UT	2,591	$1,108	$632	$1,613	$476	$1,008	$1,108
DOBSON TEL CO	431988	OK	3,464	$2,095	$915	$703	$1,180	$1,156	$1,859
DRENTHE TEL CO	310692	MI	590	$857	$454	$669	$402	$1,018	$857

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DUBOIS TEL EXCHANGE	512291	WY	2,325	$1,182	$559	$819	$623	$942	$1,182
DUCOR TELEPHONE CO	542313	CA	1,157	$1,691	$680	$1,866	$1,010	$2,278	$1,691
DUNKIRK & FREDONIA	150091	NY	5,875	$247	$66	$149	$182	$399	$247
DUO COUNTY TEL COOP	260401	KY	11,327	$899	$438	$506	$461	$469	$899
EAGLE TEL SYSTEMS	532369	OR	425	$1,600	$484	$869	$1,116	$1,474	$1,600
EAGLE VALLEY TEL CO	361383	MN	607	$351	$76	$280	$276	$755	$351
EAST ASCENSION TEL	270429	LA	29,375	$1,334	$498	$330	$836	$438	$768
EAST BUCHANAN COOP	351156	IA	1,455	$750	$394	$539	$356	$876	$750
EAST OTTER TAIL TEL	361385	MN	15,320	$634	$325	$315	$309	$298	$614
EASTERN NEBRASKA TEL	371542	NE	2,757	$442	$137	$381	$305	$727	$442
EASTERN SLOPE RURAL	462186	CO	4,211	$861	$386	$650	$475	$771	$861
EASTEX TEL COOP INC	442068	TX	24,639	$977	$403	$628	$574	$588	$977
EASTON TEL CO	361384	MN	882	$1,125	$238	$585	$888	$900	$1,125
ECKLES TEL CO	361386	MN	3,854	$671	$226	$472	$445	$496	$671
EDWARDS TEL CO	150092	NY	1,801	$757	$285	$189	$472	$485	$662
EGYPTIAN COOP ASSN	341003	IL	2,848	$876	$356	$544	$521	$909	$876
ELECTRA TELEPHONE CO	442069	TX	1,250	$946	$195	$496	$751	$1,254	$946
ELIZABETH TEL CO	270430	LA	2,685	$1,774	$676	$963	$1,098	$1,096	$1,772
ELKHART TEL CO INC	411764	KS	1,361	$2,705	$664	$794	$2,041	$1,168	$1,832
ELLIJAY TEL CO	220360	GA	12,428	$768	$320	$420	$448	$470	$768
ELLINGTON TEL CO	421874	MO	1,853	$1,249	$464	$1,114	$785	$1,232	$1,249
ELSIE COMM., INC.	371518	NE	178	$1,660	$608	$699	$1,051	$1,805	$1,660
EMILY COOP TEL CO	361387	MN	1,223	$1,830	$1,250	$1,507	$580	$888	$1,830
EMPIRE TEL CORP	150093	NY	5,646	$439	$214	$321	$225	$510	$439
EMRY dba EMRY TELCOM	502278	UT	4,271	$486	$160	$693	$326	$942	$486
ENMR TEL COOP INC-NM	492262	NM	10,086	$1,205	$659	$856	$546	$899	$1,205
ENMR TEL COOP-TX	442262	TX	681	$647	$330	$920	$317	$1,632	$647
ETEX TEL COOP INC	442070	TX	12,099	$1,222	$461	$496	$760	$585	$1,046
ETS TEL. CO., INC.	442091	TX	12,974	$666	$386	$528	$279	$466	$666
FARMERS MUTUAL COOP	351169	IA	442	$1,272	$808	$1,888	$463	$1,680	$1,272
FARMERS MUTUAL TEL	300612	OH	422	$461	$80	$709	$381	$1,295	$461

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FARMERS MUTUAL TEL	351172	IA	1,900	$1,195	$658	$912	$538	$923	$1,195
FARMERS MUTUAL TEL	351174	IA	950	$1,170	$505	$953	$665	$1,131	$1,170
FARMERS MUTUAL TEL	361389	MN	998	$1,570	$955	$2,210	$615	$1,419	$1,570
FARMERS MUTUAL TEL	472221	ID	2,912	$530	$230	$509	$300	$714	$530
FARMERS TEL CO - CO	462188	CO	488	$1,533	$668	$981	$866	$1,436	$1,533
FARMERS TEL COOP	240520	SC	44,895	$870	$457	$513	$414	$419	$870
FARMERS TELECOM COOP	250290	AL	14,819	$752	$337	$661	$415	$481	$752
FELTON TEL CO. INC.	361391	MN	598	$732	$362	$543	$370	$1,027	$732
FIDELITY TEL CO	421882	MO	13,552	$495	$187	$434	$308	$510	$495
FILER MUTUAL TEL -ID	472220	ID	1,687	$1,119	$567	$1,107	$553	$1,063	$1,119
FILER MUTUAL TEL -NV	552220	NV	537	$283	$152	$1,080	$131	$1,601	$283
FISHERS ISLAND TEL	150095	NY	983	$505	$104	$568	$401	$1,116	$505
FIVE AREA TEL CO-OP	442071	TX	5,317	$962	$482	$936	$480	$1,047	$962
FLAT ROCK TEL CO-OP	341012	IL	520	$425	$119	$494	$306	$1,313	$425
FOOTHILLS RURAL COOP	260406	KY	14,396	$1,016	$574	$741	$442	$486	$1,016
FORESTHILL-SEBASTIAN	542318	CA	2,801	$1,479	$626	$1,302	$854	$1,069	$1,479
FORT MILL TEL CO	240521	SC	21,384	$600	$260	$343	$340	$340	$600
FORT MOJAVE TEL, INC	452200	AZ	1,014	$1,370	$555	$1,093	$815	$2,185	$1,370
FRANKLIN TEL CO - MS	280454	MS	7,090	$1,301	$572	$581	$729	$759	$1,301
FULTON TEL CO	280455	MS	6,972	$618	$332	$457	$285	$558	$618
GANADO TELEPHONE CO	442076	TX	2,536	$1,496	$646	$1,228	$850	$1,400	$1,496
GARDEN VALLEY TEL CO	361395	MN	14,135	$682	$364	$842	$318	$529	$682
GEORGETOWN TEL CO	280456	MS	276	$3,081	$1,199	$621	$1,882	$1,882	$2,503
GERMANTOWN TEL CO	150097	NY	2,416	$497	$75	$255	$422	$524	$497
GERVAIS TELEPHONE CO	532373	OR	777	$1,037	$400	$1,003	$637	$1,686	$1,037
GILA RIVER TELECOM.	452179	AZ	3,641	$2,683	$1,343	$2,062	$1,339	$1,818	$2,683
GLENWOOD TEL CO	220365	GA	733	$1,342	$454	$656	$888	$1,434	$1,342
GLENWOOD TEL MEMBER	371553	NE	2,147	$1,829	$894	$845	$935	$945	$1,780
GOLDEN BELT TEL ASSN	411777	KS	5,059	$1,626	$871	$889	$755	$978	$1,626
GOLDEN WEST TELECOM	391659	SD	13,393	$1,205	$645	$963	$561	$710	$1,205
GOLDEN WEST-KADOKA	391667	SD	454	$565	$177	$553	$388	$1,313	$565

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GOLDEN WEST-VIVIAN	391686	SD	15,972	$828	$517	$699	$311	$551	$828
GOODMAN TEL CO	421886	MO	1,494	$1,396	$704	$1,090	$692	$1,346	$1,396
GORHAM TEL CO	411778	KS	273	$2,876	$1,533	$3,123	$1,343	$3,170	$2,876
GRAFTON TEL CO	341020	IL	834	$552	$164	$649	$387	$1,110	$552
GRANADA TEL CO	361399	MN	172	$478	$158	$312	$320	$1,243	$478
GRANBY TEL & TEL -MA	110036	MA	2,277	$207	$89	$238	$118	$624	$207
GRANBY TEL CO - MO	421887	MO	2,151	$1,321	$577	$1,097	$744	$1,010	$1,321
GRAND RIVER MUT-IA	351888	IA	6,262	$429	$194	$498	$234	$686	$429
GRAND RIVER MUT-MO	421888	MO	12,335	$873	$532	$873	$342	$674	$873
GRAND TEL CO INC	431994	OK	3,251	$1,287	$612	$631	$674	$1,138	$1,287
GRANITE STATE TEL	120039	NH	8,006	$515	$227	$230	$288	$412	$515
GREAT PLAINS COMMUN	371577	NE	25,547	$591	$213	$673	$378	$527	$591
GREEN HILLS TEL CORP	421890	MO	3,231	$1,425	$783	$1,309	$642	$1,200	$1,425
GRIDLEY TEL CO	341023	IL	1,214	$1,073	$330	$542	$743	$888	$1,073
GRISWOLD CO-OP TEL	351195	IA	1,712	$690	$348	$578	$343	$887	$690
GTA TELECOM, LLC	663800	GU	48,142	$578	$338	$466	$240	$857	$578
GUADALUPE VALLEY TEL	442083	TX	37,936	$773	$469	$576	$305	$486	$773
H & B COMMUNICATIONS	411781	KS	816	$1,034	$429	$959	$605	$1,565	$1,034
HAMPDEN TEL CO	100010	ME	2,401	$526	$165	$202	$361	$428	$526
HANCOCK TEL CO	150099	NY	1,550	$526	$89	$268	$438	$641	$526
HANCOCK TELECOM	320775	IN	6,098	$1,385	$796	$708	$589	$604	$1,297
HAPPY VALLEY TEL CO	542321	CA	3,011	$469	$67	$309	$402	$787	$469
HARDY TELECOM	200259	WV	3,646	$665	$330	$439	$335	$545	$665
HARGRAY TEL CO	240523	SC	35,827	$490	$146	$216	$344	$344	$490
HARRISONVILLE TEL CO	341026	IL	16,334	$707	$304	$545	$403	$557	$707
HART TEL CO	220368	GA	7,045	$590	$104	$231	$486	$477	$581
HARTINGTON TEL CO	371556	NE	1,329	$1,337	$514	$1,146	$823	$1,015	$1,337
HARTLAND & ST ALBANS	100011	ME	3,183	$421	$89	$144	$332	$347	$421
HARTMAN TEL EXCH INC	371557	NE	463	$2,799	$808	$1,536	$1,991	$2,021	$2,799
HAT ISLAND TEL CO	522417	WA	75	$599	$204	$1,075	$394	$3,076	$599
HAVILAND TEL CO	411780	KS	3,179	$1,736	$812	$874	$924	$1,076	$1,736

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HAXTUN TEL CO	462190	CO	1,347	$865	$228	$563	$636	$939	$865
HAYNEVILLE TEL CO	250299	AL	2,129	$665	$252	$720	$414	$1,221	$665
HEART OF IOWA COMM.	351297	IA	2,080	$1,913	$1,198	$1,198	$715	$1,105	$1,913
HEARTLND-HICKORYTECH	351096	IA	8,828	$255	$48	$258	$207	$462	$255
HELIX TEL CO.	532376	OR	253	$1,627	$551	$1,196	$1,076	$2,580	$1,627
HEMINGFORD COOP TEL	371558	NE	742	$2,159	$985	$984	$1,173	$1,282	$2,158
HENDERSON CO-OP TEL	371559	NE	876	$1,154	$526	$978	$629	$1,152	$1,154
HERSHEY COOP TEL CO	371561	NE	631	$1,123	$524	$696	$600	$1,127	$1,123
HIAWATHA TEL CO	310713	MI	5,310	$659	$230	$578	$428	$660	$659
HILL COUNTRY CO-OP	442086	TX	15,174	$1,050	$590	$976	$460	$934	$1,050
HILLSBORO TEL CO	330892	WI	1,468	$680	$324	$574	$356	$745	$680
HINTON TEL CO	431995	OK	2,898	$1,012	$406	$937	$606	$1,199	$1,012
HOLWAY TEL CO	421929	MO	456	$580	$188	$650	$392	$1,384	$580
HOME TEL CO	240527	SC	20,094	$558	$238	$387	$320	$499	$558
HOME TEL CO	411782	KS	1,712	$2,016	$663	$1,209	$1,352	$1,345	$2,008
HOME TEL CO-ST JACOB	341032	IL	1,017	$2,577	$763	$776	$1,814	$1,122	$1,885
HOME TELEPHONE CO	532377	OR	692	$451	$101	$476	$350	$1,366	$451
HOOD CANAL TEL CO	522419	WA	1,004	$1,045	$208	$288	$837	$966	$1,045
HOPI TELECOMM, INC.	450815	AZ	1,731	$985	$438	$1,463	$547	$1,702	$985
HOPPER TELECOMM. CO.	250300	AL	2,980	$1,351	$463	$316	$889	$610	$927
HORNITOS TEL CO	542322	CA	592	$654	$184	$665	$470	$1,772	$654
HORRY TEL COOP	240528	SC	71,027	$506	$315	$366	$192	$323	$506
HOT SPRINGS TEL CO	482241	MT	874	$935	$140	$693	$796	$1,252	$935
HUMBOLDT TEL CO	553304	NV	966	$2,181	$927	$2,108	$1,254	$2,054	$2,181
HUMPHREY'S COUNTY	290566	TN	1,534	$449	$162	$307	$287	$654	$449
IAMO TEL CO - IA	351206	IA	334	$514	$195	$619	$319	$1,611	$514
IAMO TEL CO - MO	421206	MO	853	$614	$222	$727	$392	$1,332	$614
INDIANHEAD TEL CO	330936	WI	1,997	$522	$249	$280	$273	$553	$522
INDUSTRY TEL CO	442093	TX	2,275	$1,178	$547	$798	$631	$1,086	$1,178
INLAND TEL CO -WA	522423	WA	2,484	$898	$260	$764	$638	$982	$898
INLAND TEL-ID	472423	ID	346	$1,394	$422	$1,034	$972	$2,343	$1,394

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INTERBEL TEL COOP	482242	MT	2,331	$1,614	$853	$861	$761	$750	$1,603
INTER-COMMUNITY TEL	381616	ND	2,231	$751	$199	$449	$552	$806	$751
INTERIOR TEL CO INC	613011	AK	4,404	$1,087	$256	$299	$830	$1,264	$1,087
INTERSTATE 35 TEL CO	351209	IA	1,075	$1,277	$675	$1,013	$602	$1,041	$1,277
INTERSTATE TELECOMM.	391654	SD	12,549	$826	$507	$791	$319	$539	$826
ISLAND TEL CO	100007	ME	635	$458	$119	$329	$339	$1,130	$458
ISLAND TEL CO	310677	MI	1,153	$470	$193	$353	$278	$742	$470
ITS TELECOMM. SYS.	210331	FL	2,980	$1,414	$332	$691	$1,083	$1,180	$1,414
J. B. N. TEL CO INC	411785	KS	2,141	$891	$294	$505	$597	$1,012	$891
JEFFERSON TEL CO -SD	391666	SD	414	$1,494	$181	$491	$1,313	$1,147	$1,328
JOHNSON TEL CO	361410	MN	1,771	$1,041	$483	$582	$558	$793	$1,041
K & M TEL CO, INC	371565	NE	599	$910	$238	$687	$672	$1,274	$910
KALAMA TEL CO	522426	WA	2,667	$841	$352	$340	$489	$655	$829
KALONA COOP TEL CO	351214	IA	1,824	$891	$478	$985	$413	$860	$891
KANOKLA TEL ASSN-KS	411788	KS	1,837	$2,830	$1,494	$1,123	$1,336	$1,405	$2,458
KANOKLA TEL ASSN-OK	431788	OK	1,003	$2,671	$1,554	$1,919	$1,117	$1,916	$2,671
KAPLAN TEL CO	270432	LA	3,768	$956	$324	$711	$632	$1,096	$956
KASSON & MANTORVILLE	361412	MN	4,027	$652	$343	$723	$309	$680	$652
KEARSARGE TEL CO	120045	NH	7,481	$476	$170	$177	$306	$366	$476
KENNEBEC TEL CO	391668	SD	734	$2,258	$872	$1,064	$1,386	$1,385	$2,258
KERMAN TEL-SEBASTIAN	542324	CA	6,002	$1,061	$364	$645	$697	$718	$1,061
KETCHIKAN PUBLIC UT	613013	AK	6,790	$958	$289	$423	$668	$1,698	$958
KEYSTONE-ARTHUR TEL	371567	NE	445	$1,773	$286	$476	$1,488	$1,357	$1,643
KINGDOM TELEPHONE CO	421901	MO	4,873	$824	$454	$824	$371	$756	$824
KNOLOGY - VALLEY	220371	GA	8,984	$262	$51	$402	$210	$778	$262
KNOLOGY COMM TEL	391652	SD	4,393	$589	$223	$387	$366	$638	$589
KNOLOGY TOTAL COMM	250295	AL	3,591	$622	$89	$412	$533	$863	$622
LA HARPE TEL CO	341043	IL	828	$1,681	$658	$824	$1,023	$1,240	$1,681
LA HARPE TEL CO INC	411791	KS	318	$3,912	$1,416	$2,426	$2,496	$2,356	$3,771
LA JICARITA RURAL	492263	NM	1,979	$1,360	$543	$672	$817	$938	$1,360
LA VALLE TEL COOP	330899	WI	1,599	$987	$444	$687	$543	$827	$987

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LA WARD TEL EXCHANGE	442103	TX	884	$1,607	$600	$1,370	$1,007	$1,983	$1,607
LACKAWAXEN TELECOM	170177	PA	2,730	$346	$59	$209	$286	$523	$346
LAFOURCHE TEL CO	270433	LA	10,312	$481	$50	$326	$431	$849	$481
LAKE LIVINGSTON TEL	442104	TX	816	$2,412	$695	$823	$1,716	$1,529	$2,224
LAKESIDE TEL. CO.	280457	MS	274	$1,759	$60	$442	$1,698	$1,698	$1,759
LANCASTER TEL CO	240531	SC	18,327	$449	$100	$279	$349	$409	$449
LAVACA TEL CO-AR	401704	AR	1,194	$1,793	$751	$974	$1,042	$1,060	$1,793
LAVACA TEL CO-OK	431704	OK	1,076	$1,567	$659	$919	$908	$1,433	$1,567
LEACO RURAL TEL COOP	492264	NM	1,711	$2,204	$1,096	$1,266	$1,109	$1,604	$2,204
LEAF RIVER TEL CO	341045	IL	401	$1,929	$736	$807	$1,192	$1,333	$1,929
LEMONWEIR VALLEY TEL	330900	WI	2,840	$1,105	$626	$635	$479	$651	$1,105
LENNON TEL CO	310708	MI	925	$1,059	$174	$390	$885	$957	$1,059
LE-RU TELEPHONE CO	421908	MO	1,409	$1,558	$651	$656	$907	$1,221	$1,558
LESLIE COUNTY TEL CO	260411	KY	8,282	$567	$177	$253	$390	$434	$567
LEWIS RIVER TEL CO	522427	WA	5,232	$483	$164	$434	$319	$690	$483
LIGONIER TEL CO	320783	IN	1,540	$1,345	$539	$1,267	$806	$1,125	$1,345
LINCOLN CTY TEL SYS	552351	NV	2,360	$603	$293	$1,441	$310	$1,483	$603
LINCOLN TEL CO INC	482244	MT	983	$637	$259	$574	$379	$885	$637
LINCOLNVILLE NETWRKS	100003	ME	11,486	$272	$80	$216	$192	$384	$272
LIPAN TEL CO	442105	TX	1,435	$1,815	$753	$953	$1,062	$1,764	$1,815
LISMORE COOP TEL CO	361419	MN	312	$1,293	$808	$3,583	$485	$2,096	$1,293
LITTLE MIAMI COMM.	300613	OH	1,961	$597	$247	$312	$350	$632	$597
LOGAN TEL. COOP. INC	260413	KY	5,783	$1,071	$657	$688	$414	$624	$1,071
LONSDALE TEL CO	361422	MN	1,567	$1,571	$992	$906	$579	$777	$1,484
LOST NATION-ELWOOD	351229	IA	555	$1,728	$775	$1,556	$953	$1,496	$1,728
LUCK TEL CO	330902	WI	1,931	$793	$357	$485	$436	$599	$793
LUDLOW TEL CO	140058	VT	4,100	$367	$130	$130	$238	$338	$367
MADISON COUNTY TEL	401709	AR	3,418	$879	$286	$473	$593	$765	$879
MADISON TEL CO	341049	IL	1,455	$1,589	$302	$621	$1,287	$1,057	$1,359
MADISON TEL., LLC	411801	KS	546	$1,644	$532	$576	$1,112	$1,603	$1,644
MAHANOY & MAHANTANGO	170183	PA	3,252	$459	$166	$178	$293	$525	$459

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MARGARETVILLE TEL CO	150104	NY	3,378	$332	$109	$185	$223	$445	$332
MARK TWAIN RURAL TEL	421914	MO	3,709	$1,087	$549	$581	$538	$832	$1,087
MARQUETTE-ADAMS COOP	330908	WI	3,268	$1,480	$957	$830	$523	$697	$1,353
MASHELL TELECOM INC	522431	WA	3,329	$766	$125	$310	$642	$661	$766
MATANUSKA TEL ASSOC	613015	AK	46,802	$821	$430	$327	$391	$506	$719
MCCLELLANVILLE TEL	240533	SC	1,478	$996	$337	$443	$659	$1,034	$996
MCCLURE TEL CO	300598	OH	582	$1,974	$879	$1,368	$1,095	$1,417	$1,974
MCDONALD COUNTY TEL	421912	MO	3,529	$1,239	$511	$756	$728	$1,046	$1,239
MCDONOUGH TEL COOP	341047	IL	3,592	$1,324	$608	$907	$716	$906	$1,324
MCLOUD TEL CO	432006	OK	7,038	$1,088	$422	$422	$666	$666	$1,088
MCNABB TEL CO	341048	IL	386	$476	$127	$491	$349	$1,289	$476
MCTA, INC.	123321	NH	9,131	$377	$145	$151	$232	$311	$377
MEDICINE PARK TEL CO	432008	OK	676	$2,078	$646	$1,479	$1,432	$2,295	$2,078
MERCHANTS & FARMERS	320788	IN	415	$711	$176	$429	$535	$1,047	$711
MERRIMACK COUNTY TEL	120047	NH	6,499	$404	$150	$193	$254	$392	$404
MESCALERO APACHE	491231	NM	1,151	$2,908	$1,002	$1,081	$1,906	$1,809	$2,811
MID CENTURY TEL COOP	341054	IL	3,977	$741	$458	$1,049	$283	$959	$741
MID MAINE TELECOM	103315	ME	4,185	$498	$156	$121	$342	$339	$460
MID STATE TEL CO	361433	MN	5,827	$503	$229	$363	$274	$460	$503
MID-AMERICA TEL INC	432010	OK	1,261	$849	$418	$609	$431	$1,542	$849
MIDDLEBURGH TEL CO	150105	NY	5,848	$284	$69	$207	$215	$422	$284
MID-MISSOURI TEL CO	421917	MO	3,437	$1,296	$498	$583	$798	$897	$1,296
MID-PLAINS RURAL TEL	442112	TX	2,796	$1,071	$474	$1,324	$597	$1,396	$1,071
MID-RIVERS TEL COOP	482246	MT	10,042	$774	$359	$527	$415	$559	$774
MIDSTATE COMM., INC.	391670	SD	4,315	$959	$664	$1,314	$295	$952	$959
MIDSTATE TEL CO	381617	ND	1,870	$1,018	$419	$876	$599	$826	$1,018
MIDVALE TEL EXCH INC	472226	ID	957	$1,609	$538	$1,116	$1,071	$1,472	$1,609
MIDVALE-AZ	452226	AZ	1,226	$3,118	$1,377	$2,170	$1,740	$1,976	$3,118
MIDWAY TEL CO	310711	MI	703	$998	$344	$813	$654	$1,194	$998
MIDWAY TEL CO	330909	WI	7,154	$444	$152	$220	$292	$291	$443
MILLER TEL CO - MO	421920	MO	819	$991	$271	$524	$720	$1,131	$991

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MILLINGTON TEL CO	290571	TN	20,820	$435	$144	$353	$292	$430	$435
MILLRY TEL CO	250304	AL	6,056	$724	$256	$513	$468	$712	$724
MILLTOWN MUTUAL TEL	330910	WI	2,137	$931	$390	$481	$541	$567	$931
MINBURN TELECOMM.	351158	IA	701	$777	$367	$886	$410	$1,091	$777
MOAPA VALLEY TEL CO.	552353	NV	3,302	$374	$141	$1,011	$233	$1,528	$374
MOKAN DIAL INC-KS	411807	KS	3,227	$949	$300	$431	$649	$762	$949
MOKAN DIAL INC-MO	421807	MO	688	$961	$366	$577	$595	$1,109	$961
MOLALLA TEL CO.	532383	OR	4,822	$1,192	$586	$858	$605	$792	$1,192
MON-CRE TEL COOP	250305	AL	2,445	$1,143	$508	$465	$635	$760	$1,100
MONITOR COOP TEL	532384	OR	555	$1,478	$593	$910	$885	$1,566	$1,478
MONON TEL CO	320790	IN	947	$1,556	$544	$729	$1,011	$1,101	$1,556
MONROE TELEPHONE CO.	532385	OR	884	$1,215	$473	$793	$741	$1,375	$1,215
MONTROSE MUTUAL TEL	341058	IL	1,423	$479	$113	$581	$365	$1,054	$479
MOULTRIE INDEPENDENT	341060	IL	569	$710	$149	$650	$561	$1,314	$710
MOUND BAYOU TEL & CO	280462	MS	690	$1,083	$559	$1,475	$524	$1,910	$1,083
MOUNDRIDGE TEL CO	411808	KS	2,417	$1,078	$484	$484	$595	$824	$1,078
MOUNDVILLE TEL CO	250307	AL	1,346	$888	$394	$695	$494	$1,082	$888
MOUNT HOREB TEL CO	330916	WI	3,728	$602	$324	$247	$278	$541	$525
MOUNTAIN RURAL COOP	260414	KY	14,989	$557	$279	$769	$278	$493	$557
MT VERNON TEL CO	330917	WI	10,537	$682	$264	$368	$418	$357	$621
MUENSTER DBA NORTEX	442116	TX	3,826	$1,264	$594	$731	$671	$976	$1,264
MUKLUK TEL CO INC	613016	AK	1,361	$1,044	$217	$507	$828	$1,273	$1,044
MUTUAL TEL CO	351252	IA	4,218	$651	$396	$632	$255	$548	$651
MUTUAL TEL CO	411809	KS	437	$3,778	$1,657	$2,302	$2,120	$2,199	$3,778
NATIONAL OF ALABAMA	250286	AL	1,665	$813	$343	$583	$470	$1,048	$813
NE MISSOURI RURAL	421931	MO	6,843	$1,102	$648	$789	$454	$733	$1,102
NEBRASKA CENTRAL TEL	371574	NE	6,319	$667	$299	$583	$368	$732	$667
NEHALEM TELECOMM.	532387	OR	2,814	$520	$168	$620	$352	$869	$520
NELSON TEL COOP	330918	WI	3,691	$1,170	$718	$684	$451	$644	$1,135
NELSON-BALL GROUND	220375	GA	6,690	$553	$233	$390	$319	$545	$553
NEMONT TEL COOP - ND	382247	ND	212	$3,294	$2,733	$4,638	$561	$3,370	$3,294

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NEMONT TEL COOP-MT	482247	MT	11,196	$1,037	$452	$888	$585	$613	$1,037
NEW CASTLE TEL. CO.	193029	VA	2,110	$500	$203	$357	$297	$684	$500
NEW FLORENCE TEL CO	421927	MO	387	$1,035	$160	$580	$875	$1,453	$1,035
NEW HOPE TEL COOP	250308	AL	4,960	$1,187	$777	$1,056	$411	$806	$1,187
NEW LONDON TEL CO	421928	MO	747	$563	$198	$435	$365	$978	$563
NEW PARIS TEL INC	320797	IN	1,727	$645	$117	$358	$529	$713	$645
NEW ULM TELECOM, INC	361442	MN	10,727	$390	$159	$218	$232	$336	$390
NEWPORT TEL CO	150107	NY	2,987	$478	$165	$220	$313	$464	$478
NIAGARA TEL CO	330920	WI	3,601	$704	$298	$399	$406	$547	$704
NICHOLVILLE TEL CO	150108	NY	1,590	$648	$131	$221	$517	$525	$648
NORTH ARKANSAS TEL	401713	AR	6,111	$917	$382	$390	$535	$693	$917
NORTH CENTRAL COOP	290573	TN	19,553	$794	$456	$636	$337	$449	$794
NORTH DAKOTA TEL CO	381447	ND	13,946	$640	$306	$529	$334	$521	$640
NORTH PENN TEL CO	170192	PA	4,900	$685	$263	$285	$421	$487	$685
NORTH STATE TEL CO.	532388	OR	473	$4,196	$2,279	$2,718	$1,917	$2,211	$4,196
NORTHEAST FLORIDA	210335	FL	7,424	$748	$187	$359	$561	$633	$748
NORTHEAST LOUISIANA	270435	LA	643	$1,525	$523	$1,102	$1,002	$1,793	$1,525
NORTHEAST NEBRASKA	371576	NE	6,126	$772	$509	$1,311	$263	$853	$772
NORTHERN TEL COOP	482248	MT	1,536	$1,173	$565	$781	$608	$1,052	$1,173
NORTHFIELD TEL CO	140061	VT	2,436	$334	$99	$111	$235	$398	$334
NORTHWESTERN INDIANA	320800	IN	9,877	$456	$142	$302	$314	$463	$456
NOXAPATER TEL CO	280461	MS	776	$1,398	$130	$431	$1,268	$1,124	$1,254
NUCLA-NATURITA TEL	462193	CO	1,589	$773	$352	$942	$421	$1,297	$773
NUNN TEL CO	462194	CO	559	$3,140	$1,718	$1,561	$1,422	$1,360	$2,920
NUSHAGAK ELEC & TEL	613018	AK	2,114	$1,157	$365	$426	$792	$1,416	$1,157
OGDEN TEL CO	310714	MI	320	$977	$325	$695	$652	$1,445	$977
OKLAHOMA COMM SYSTEM	431984	OK	13,988	$605	$244	$265	$361	$513	$605
OKLAHOMA TEL & TEL	432013	OK	1,498	$1,362	$293	$632	$1,069	$1,415	$1,362
OKLAHOMA WESTERN TEL	432014	OK	2,577	$681	$329	$492	$352	$1,182	$681
ONEIDA COUNTY RURAL	150111	NY	2,315	$434	$177	$241	$257	$487	$434
ONEIDA TEL EXCHANGE	341066	IL	472	$469	$154	$680	$315	$1,287	$469

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ONTARIO TEL CO, INC.	150112	NY	2,628	$790	$292	$475	$499	$688	$790
ONTONAGON COUNTY TEL	310717	MI	3,325	$561	$187	$569	$374	$660	$561
ORCHARD FARM TEL CO	421934	MO	641	$478	$177	$428	$301	$1,015	$478
OREGON FARMERS MUT	421935	MO	1,019	$662	$207	$483	$455	$893	$662
OREGON TEL CORP	532389	OR	1,558	$2,434	$1,418	$2,423	$1,016	$1,499	$2,434
OREGON-IDAHO UTIL.	532390	OR	638	$2,986	$1,265	$1,646	$1,721	$2,083	$2,986
ORISKANY FALLS TEL	150114	NY	434	$580	$211	$492	$370	$898	$580
OSAKIS TEL CO	361448	MN	1,486	$812	$504	$498	$308	$554	$806
OTZ TEL COOPERATIVE	613019	AK	2,950	$1,090	$409	$1,231	$681	$1,775	$1,090
OXFORD WEST TEL CO	100002	ME	5,734	$467	$95	$190	$372	$372	$467
Ozark Tel. Co.	421866	MO	2,127	$1,103	$560	$718	$544	$1,090	$1,103
PANHANDLE TEL COOP	432016	OK	13,384	$1,118	$670	$722	$448	$710	$1,118
PARTNER COMM. COOP.	351187	IA	891	$1,621	$858	$1,373	$763	$1,388	$1,621
PATTERSONVILLE TEL	150116	NY	905	$506	$117	$163	$388	$704	$506
PAUL BUNYAN RURAL	361451	MN	11,704	$1,005	$619	$810	$386	$525	$1,005
PBT TELECOM, INC.	240539	SC	12,672	$1,052	$475	$443	$577	$509	$951
PEETZ COOP TEL CO	462196	CO	227	$1,547	$614	$907	$933	$1,910	$1,547
PEMBROKE TEL CO	220376	GA	3,334	$1,079	$433	$577	$646	$850	$1,079
PENASCO VALLEY TEL	492270	NM	2,916	$2,075	$1,201	$1,388	$874	$1,586	$2,075
PEND OREILLE TEL.	522418	WA	1,827	$675	$114	$367	$561	$815	$675
PENINSULA TEL CO -MI	310720	MI	1,112	$350	$75	$245	$275	$747	$350
PEOPLES RURAL COOP	260415	KY	7,700	$1,011	$445	$821	$566	$555	$1,000
PEOPLES TEL CO	250314	AL	12,413	$728	$279	$372	$449	$472	$728
PEOPLES TEL CO	290576	TN	4,425	$658	$336	$407	$322	$594	$658
PEOPLES TEL CO - MN	361453	MN	1,689	$768	$372	$272	$396	$546	$668
PEOPLES TEL CO. - OR	532391	OR	1,092	$1,292	$562	$1,499	$730	$1,403	$1,292
PEOPLES TEL COOP -TX	442130	TX	11,701	$914	$399	$816	$515	$711	$914
PEOPLES TELECOM LLC	411814	KS	1,303	$1,841	$758	$630	$1,083	$1,031	$1,661
PERKINSVILLE TEL CO	140062	VT	801	$275	$67	$100	$208	$536	$275
PERRY-SPENCER RURAL	320807	IN	5,307	$888	$412	$885	$476	$826	$888
PHILLIPS COUNTY TEL	462197	CO	1,674	$1,451	$780	$1,337	$671	$973	$1,451

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PIEDMONT RURAL COOP	240538	SC	10,708	$842	$483	$365	$359	$527	$724
PIGEON TEL CO	310721	MI	2,595	$1,018	$308	$457	$710	$699	$1,007
PINE BELT TEL CO	250315	AL	2,324	$1,294	$687	$981	$607	$1,079	$1,294
PINE ISLAND TEL CO	361454	MN	2,771	$590	$341	$325	$249	$492	$574
PINE TEL SYSTEM INC.	532392	OR	902	$4,411	$3,043	$2,203	$1,368	$1,519	$3,570
PINE TELEPHONE CO	432017	OK	4,998	$618	$283	$700	$335	$1,035	$618
PINELAND TEL COOP	220377	GA	10,502	$893	$656	$910	$237	$790	$893
PINNACLES TEL CO	542346	CA	253	$2,790	$904	$1,093	$1,886	$3,251	$2,790
PIONEER TEL ASSN INC	411817	KS	12,304	$808	$371	$444	$436	$651	$808
PIONEER TEL CO	522437	WA	725	$1,365	$831	$1,045	$534	$1,377	$1,365
PIONEER TEL COOP	532393	OR	12,644	$786	$392	$674	$394	$784	$786
PIONEER TEL COOP INC	432018	OK	46,095	$531	$212	$695	$318	$550	$531
PLAINS COOP TEL ASSN	462199	CO	1,222	$2,002	$816	$987	$1,186	$1,320	$2,002
PLAINVIEW TEL CO	371582	NE	979	$1,740	$796	$1,574	$944	$1,203	$1,740
PLANT TEL. CO.	220379	GA	7,268	$735	$288	$528	$447	$747	$735
PLANTERS RURAL COOP	220378	GA	7,450	$1,283	$850	$945	$434	$793	$1,283
POKA-LAMBRO TEL COOP	442131	TX	2,401	$974	$343	$903	$631	$1,479	$974
POLAR COMM MUT AID	381630	ND	7,758	$559	$280	$604	$279	$548	$559
PORT BYRON TEL CO	150118	NY	2,371	$537	$190	$250	$348	$550	$537
POTLATCH TEL CO INC	472230	ID	1,762	$478	$192	$399	$285	$823	$478
POTTAWATOMIE TEL CO	432020	OK	2,188	$1,516	$557	$595	$959	$1,200	$1,516
PRAIRIE GROVE TEL CO	401718	AR	8,086	$959	$430	$394	$529	$529	$922
PRICE COUNTY TEL CO	330937	WI	4,143	$456	$260	$283	$196	$416	$456
PROJECT MUTUAL TEL	472231	ID	5,871	$627	$295	$727	$332	$753	$627
PROJECT TEL CO	482250	MT	4,633	$1,036	$385	$884	$650	$782	$1,036
PUBLIC SERVICE TEL	220381	GA	9,097	$1,169	$481	$466	$688	$631	$1,097
PULASKI-WHITE RURAL	320813	IN	1,318	$985	$335	$669	$650	$955	$985
QUINCY TEL CO-FL DIV	210338	FL	10,326	$513	$202	$365	$311	$605	$513
QUINCY TEL CO-GA DIV	220338	GA	575	$646	$283	$530	$362	$1,326	$646
RADCLIFFE TEL CO	351277	IA	452	$950	$507	$1,269	$443	$1,437	$950
RAGLAND TEL CO	250316	AL	1,014	$1,759	$576	$715	$1,183	$1,217	$1,759

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RAINBOW TELECOM	411820	KS	1,692	$3,021	$2,019	$2,323	$1,002	$1,581	$3,021
RANGE TEL COOP - WY	512251	WY	14,862	$908	$497	$516	$411	$514	$908
RANGE TEL COOP-MT	482251	MT	4,319	$738	$275	$494	$462	$696	$738
RED RIVER RURAL TEL	381631	ND	3,509	$1,056	$631	$1,230	$425	$862	$1,056
RESERVATION TEL COOP	381632	ND	6,629	$1,060	$519	$1,129	$541	$789	$1,060
RESERVE TEL CO	270438	LA	3,779	$562	$148	$298	$414	$909	$562
RICE BELT TEL CO	401721	AR	704	$1,615	$282	$1,523	$1,333	$1,886	$1,615
RICHLAND-GRANT COOP	330942	WI	2,342	$1,081	$620	$869	$461	$850	$1,081
RICHMOND TEL CO	110037	MA	939	$444	$80	$309	$365	$813	$444
RICO TEL CO	462201	CO	152	$569	$268	$1,741	$301	$2,346	$569
RINGGOLD TEL CO	220382	GA	10,089	$623	$289	$329	$334	$445	$623
RIO VIRGIN TEL CO	552356	NV	9,519	$436	$244	$852	$192	$794	$436
RIVIERA TEL CO INC	442134	TX	1,184	$1,988	$433	$1,492	$1,555	$2,325	$1,988
ROANOKE & BOTETOURT	190249	VA	8,498	$665	$282	$599	$383	$569	$665
ROANOKE TEL CO	250317	AL	4,033	$609	$239	$590	$370	$748	$609
ROBERTS COUNTY COOP	391674	SD	1,827	$1,049	$581	$748	$469	$1,123	$1,049
ROCHESTER TEL CO	320815	IN	5,625	$785	$406	$500	$378	$569	$785
ROCK COUNTY TEL CO	371586	NE	835	$460	$34	$369	$426	$947	$460
ROCK HILL TEL CO	240542	SC	39,493	$321	$105	$232	$216	$279	$321
ROGGEN TEL COOP CO	462202	CO	228	$1,985	$913	$1,223	$1,072	$1,709	$1,985
ROOME TELECOMM INC	532375	OR	527	$721	$214	$560	$506	$1,557	$721
ROOSEVELT CNTY RURAL	492272	NM	1,522	$1,427	$609	$1,370	$818	$1,625	$1,427
RURAL TEL CO - ID	472233	ID	684	$2,530	$1,088	$1,849	$1,442	$2,107	$2,530
RURAL TEL CO - NV	552233	NV	893	$1,267	$428	$1,110	$839	$1,511	$1,267
RURAL TEL SERVICE CO	411826	KS	8,164	$2,545	$893	$712	$1,652	$835	$1,546
RYE TELEPHONE CO	462203	CO	2,280	$1,799	$772	$970	$1,027	$1,179	$1,799
S & A TEL CO INC	411829	KS	702	$2,252	$805	$564	$1,447	$1,307	$1,871
S & T TEL COOP ASSN	411827	KS	2,455	$2,449	$1,087	$795	$1,363	$1,166	$1,961
S. CENTRAL TEL - KS	411831	KS	1,528	$2,627	$1,245	$1,341	$1,382	$1,586	$2,627
S. CENTRAL TEL - OK	431831	OK	297	$5,443	$1,818	$1,646	$3,625	$2,359	$4,004
SACRED WIND	493403	NM	2,600	$3,182	$1,877	$2,082	$1,306	$1,507	$3,182

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SADDLEBACK COMM CO	457991	AZ	1,041	$2,554	$1,146	$2,948	$1,409	$2,877	$2,554
SALINA-SPAVINAW TEL	432022	OK	6,344	$619	$209	$367	$410	$826	$619
SALUDA MOUNTAIN TEL	230498	NC	1,461	$673	$297	$549	$375	$851	$673
SAN CARLOS APACHE	452169	AZ	2,529	$1,503	$820	$1,983	$683	$1,708	$1,503
SANDWICH ISLES COMM.	623021	HI	2,334	$9,278	$5,742	$2,263	$3,536	$3,536	$5,798
SANTA ROSA TEL COOP	442141	TX	1,872	$1,277	$497	$1,194	$780	$1,674	$1,277
SANTEL COMM. COOP.	391676	SD	4,447	$903	$551	$688	$352	$739	$903
SCIO MUTUAL TEL ASSN	532397	OR	1,598	$1,781	$1,117	$1,002	$663	$1,173	$1,665
SCOTT COUNTY COOP	190248	VA	5,952	$874	$393	$965	$481	$703	$874
SCOTT COUNTY TEL CO	403031	AR	130	$1,684	$429	$739	$1,256	$2,560	$1,684
SE INDIANA RURAL	320819	IN	4,157	$1,203	$597	$790	$606	$702	$1,203
SE NEBRASKA COMM INC	371591	NE	3,113	$1,029	$349	$544	$680	$825	$1,029
SE TEL OF WISCONSIN	330952	WI	5,724	$505	$208	$235	$297	$421	$505
SENECA TEL CO	421945	MO	2,796	$993	$499	$893	$494	$927	$993
SHAWNEE TEL. CO.	341025	IL	3,626	$1,804	$725	$1,100	$1,079	$1,045	$1,771
SHELL ROCK COMM	351295	IA	836	$685	$444	$1,302	$241	$1,128	$685
SHIAWASSEE TEL CO	310726	MI	4,440	$543	$227	$326	$317	$548	$543
SHIDLER TEL CO	432023	OK	728	$2,886	$1,575	$2,061	$1,311	$3,172	$2,886
SIERRA TELEPHONE CO	542338	CA	20,806	$842	$370	$400	$472	$487	$842
SILVER STAR TEL- ID	472295	ID	3,992	$1,749	$671	$513	$1,078	$609	$1,122
SILVER STAR TEL-WY	512295	WY	2,664	$1,239	$458	$604	$780	$701	$1,159
SIREN TEL CO, INC	330949	WI	2,249	$922	$476	$751	$446	$648	$922
SKYLINE TELECOM CO.	520581	WA	30	$12,290	$6,303	$6,592	$5,986	$8,034	$12,290
SKYLINE TELECOM, INC	521402	WA	140	$1,250	$359	$919	$891	$2,257	$1,250
SLEDGE TEL CO	280466	MS	369	$2,192	$1,288	$1,893	$905	$2,079	$2,192
SLEEPY EYE TEL CO	361483	MN	4,878	$421	$216	$282	$204	$465	$421
SMART CITY TEL LLC	210330	FL	9,751	$616	$186	$295	$430	$533	$616
SMITHVILLE COMM.	320818	IN	24,750	$1,377	$703	$835	$674	$486	$1,189
SOMERSET TEL CO	100024	ME	9,475	$446	$115	$164	$331	$318	$433
SOUTH ARKANSAS TEL	401702	AR	3,041	$1,024	$373	$517	$652	$893	$1,024
SOUTH CENTRAL RURAL	260418	KY	25,845	$802	$482	$442	$320	$404	$763

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SOUTH CENTRAL UTAH	502286	UT	11,732	$614	$321	$618	$293	$658	$614
SOUTH PARK TEL. CO.	462195	CO	167	$6,116	$2,087	$1,197	$4,029	$2,160	$3,357
SOUTH PLAINS TEL	442143	TX	4,104	$760	$321	$871	$439	$1,053	$760
SOUTH SLOPE COOP TEL	351298	IA	9,956	$671	$394	$666	$277	$476	$671
SOUTHEAST MS TEL CO	283301	MS	2,997	$846	$386	$364	$460	$790	$824
SOUTHERN KANSAS TEL	411833	KS	3,986	$1,794	$746	$696	$1,048	$1,048	$1,744
SOUTHERN MONTANA TEL	482254	MT	947	$2,902	$1,692	$2,045	$1,210	$1,486	$2,902
SOUTHWEST TEXAS TEL	442135	TX	4,213	$1,439	$874	$1,225	$566	$1,536	$1,439
SOUTHWESTERN TEL CO	452174	AZ	3,302	$675	$307	$714	$368	$1,220	$675
SPRING GROVE COMM.	361485	MN	1,236	$1,152	$821	$2,007	$331	$1,108	$1,152
SPRING VALLEY TEL CO	330953	WI	1,065	$1,441	$816	$826	$626	$856	$1,441
SPRINGPORT TEL CO	310728	MI	1,380	$651	$220	$493	$431	$714	$651
SPRUCE KNOB SENECA	200257	WV	1,166	$1,537	$931	$1,268	$607	$970	$1,537
ST JOHN TEL CO	522442	WA	587	$3,411	$2,277	$2,362	$1,134	$1,717	$3,411
ST STEPHEN TEL CO	240544	SC	3,857	$582	$229	$328	$353	$690	$582
STANTON TELECOM INC.	371592	NE	1,089	$2,073	$844	$1,353	$1,229	$1,186	$2,030
STAR MEMBERSHIP CORP	230502	NC	16,205	$628	$323	$687	$305	$524	$628
STAR TEL CO	270441	LA	3,210	$1,340	$110	$381	$1,229	$966	$1,076
STAYTON COOP TEL CO	532399	OR	5,712	$841	$480	$849	$361	$806	$841
STEELVILLE TEL EXCH	421949	MO	4,211	$1,265	$547	$748	$718	$777	$1,265
STOCKBRIDGE & SHERWD	330954	WI	2,287	$607	$287	$313	$321	$525	$607
STOCKHOLM-STRANDBURG	391679	SD	597	$764	$409	$557	$355	$1,193	$764
STOUTLAND TEL CO	421951	MO	1,268	$725	$278	$353	$448	$762	$725
STRASBURG TEL CO	462207	CO	1,534	$677	$312	$434	$366	$590	$677
STRATFORD MUTUAL TEL	351305	IA	553	$1,385	$736	$1,358	$650	$1,403	$1,385
SUGAR VALLEY TEL CO	170206	PA	1,035	$555	$215	$244	$341	$737	$555
SUMMIT TEL & TEL -AK	613028	AK	252	$3,906	$1,324	$1,607	$2,581	$2,683	$3,906
SUNMAN TELECOMM CORP	320825	IN	4,355	$894	$309	$498	$585	$591	$894
SUREWEST TEL.	542334	CA	58,058	$542	$268	$249	$274	$342	$523
SW ARKANSAS TEL COOP	401724	AR	5,103	$1,243	$647	$805	$596	$901	$1,243
SW OKLAHOMA TEL CO	432025	OK	647	$634	$102	$634	$532	$1,975	$634

Study Area Name	SAC	State	Loops	Current CPL	Current Capex CPL	90% Capex CPL Estimate	Current Opex CPL	90% Opex CPL Estimate	CPL used to Determine Support
SWISHER TEL CO	351304	IA	748	$858	$783	$1,219	$75	$1,144	$858
SYCAMORE TEL CO	300658	OH	1,529	$351	$88	$337	$263	$826	$351
TABLE TOP TEL CO	453334	AZ	3,993	$1,405	$767	$1,423	$638	$1,448	$1,405
TATUM TEL CO	442150	TX	909	$777	$171	$510	$606	$1,159	$777
TAYLOR TEL CO-OP INC	442151	TX	6,173	$886	$466	$975	$419	$1,145	$886
TELLICO TEL CO	290578	TN	8,160	$466	$205	$304	$261	$495	$466
TENINO TELEPHONE CO	522446	WA	3,181	$976	$383	$353	$593	$685	$946
TENNESSEE TEL CO	290575	TN	47,085	$517	$253	$285	$264	$302	$517
TENNEY TEL CO	330958	WI	1,031	$542	$216	$382	$327	$642	$542
TERRAL TEL CO	432029	OK	215	$5,077	$1,837	$1,151	$3,240	$2,761	$3,912
THE BLAIR TEL CO	371524	NE	6,597	$573	$185	$283	$388	$456	$573
THE CHAMPAIGN TEL CO	300594	OH	7,103	$659	$272	$311	$387	$492	$659
THE CHILLICOTHE TEL	300597	OH	22,252	$900	$390	$371	$509	$386	$757
THE NOVA TEL CO	300644	OH	970	$1,225	$258	$464	$967	$819	$1,078
THE PONDEROSA TEL CO	542332	CA	8,435	$1,718	$865	$1,144	$853	$1,095	$1,718
THE SISKIYOU TEL CO	542339	CA	4,417	$1,993	$1,116	$1,761	$878	$1,175	$1,993
THREE RIVER TELCO	371525	NE	1,193	$1,547	$798	$1,279	$749	$1,447	$1,547
TOHONO O'ODHAM UTIL.	452173	AZ	3,803	$1,135	$634	$1,145	$501	$1,073	$1,135
TOLEDO TELEPHONE CO	522447	WA	1,912	$1,343	$639	$669	$704	$971	$1,343
TOPSHAM TEL CO	140068	VT	1,598	$1,178	$437	$587	$742	$645	$1,081
TOTAH COMMUNICATIONS	412030	KS	1,019	$1,679	$654	$930	$1,024	$1,916	$1,679
TOTAH COMMUNICATIONS	432030	OK	1,818	$1,089	$461	$851	$628	$1,564	$1,089
TOTELCOM COMM.	442060	TX	4,126	$742	$156	$476	$587	$891	$742
TOWNSHIP TEL CO	150129	NY	2,588	$709	$319	$256	$390	$496	$647
TRANS-CASCADES TEL	532378	OR	214	$1,633	$334	$728	$1,299	$2,552	$1,633
TRI COUNTY TEL ASSN	512296	WY	5,903	$1,677	$652	$679	$1,026	$693	$1,345
TRIANGLE TEL COOP	482257	MT	10,337	$1,324	$918	$1,737	$406	$695	$1,324
TRI-COUNTY COMM COOP	330960	WI	3,444	$987	$481	$566	$506	$636	$987
TRI-COUNTY TEL ASSN	411839	KS	2,849	$2,022	$1,054	$846	$968	$1,049	$1,814
TRI-COUNTY TEL CO-AR	401726	AR	5,863	$1,035	$359	$361	$676	$676	$1,035
TRUMANSBURG TEL CO.	150131	NY	4,451	$692	$296	$312	$396	$538	$692

Study Area Name	SAC	State	Loops	Current CPL	Current Capex CPL	90% Capex CPL Estimate	Current Opex CPL	90% Opex CPL Estimate	CPL used to Determine Support
TULAROSA BASIN TEL.	492265	NM	4,036	$1,508	$800	$992	$707	$1,033	$1,508
TWIN LAKES TEL COOP	290579	TN	33,878	$581	$342	$600	$239	$421	$581
TWIN VALLEY TEL INC	411840	KS	1,931	$1,213	$548	$824	$664	$1,289	$1,213
TWIN VALLEY-ULEN TEL	361491	MN	3,114	$787	$452	$495	$335	$606	$787
UBTA-UBET/STRATA	502287	UT	3,302	$1,192	$419	$524	$773	$992	$1,192
UNION RIVER TEL CO	100027	ME	1,211	$1,438	$710	$710	$728	$833	$1,438
UNION TEL CO	120049	NH	5,320	$332	$113	$246	$219	$456	$332
UNION TEL CO	330962	WI	3,875	$777	$412	$436	$366	$554	$777
UNION TELEPHONE CO	512297	WY	6,031	$501	$228	$733	$273	$759	$501
UNITED FARMERS TEL	351316	IA	547	$1,249	$685	$1,970	$564	$1,553	$1,249
UNITED TEL ASSN	411841	KS	4,767	$1,439	$751	$739	$688	$927	$1,427
UNITED TEL MUTUAL	381636	ND	10,082	$677	$386	$556	$291	$493	$677
UNITED UTILITIES INC	613023	AK	6,673	$749	$182	$500	$567	$1,015	$749
UNITEL, INC.	100029	ME	4,001	$597	$186	$240	$411	$448	$597
UPPER PENINSULA TEL	310732	MI	5,012	$868	$447	$706	$421	$719	$868
UTC OF TN	290581	TN	12,996	$832	$548	$669	$284	$635	$832
UTELCO, INC	330963	WI	12,453	$392	$157	$230	$235	$337	$392
VALLEY TEL COOP - NM	492176	NM	1,150	$2,461	$1,608	$2,271	$853	$2,255	$2,461
VALLEY TEL CO-OP -TX	442159	TX	5,765	$1,979	$1,037	$1,612	$942	$1,520	$1,979
VALLEY TEL COOP-AZ	452176	AZ	5,983	$1,745	$1,026	$1,524	$719	$1,233	$1,745
VALLEY TELECOMM.	391685	SD	3,190	$1,476	$892	$1,139	$584	$911	$1,476
VALLIANT TEL CO	432032	OK	1,654	$953	$389	$654	$564	$1,318	$953
VENTURE COMM. COOP	391680	SD	10,226	$958	$650	$765	$308	$613	$958
VERMONT TEL. CO-VT	147332	VT	17,646	$569	$187	$187	$382	$311	$499
VERNON TEL CO	150133	NY	1,758	$386	$165	$323	$221	$573	$386
VERNON TEL COOP	330966	WI	6,409	$612	$259	$510	$353	$546	$612
VOLCANO TEL CO	542343	CA	10,145	$777	$368	$458	$409	$608	$777
W. RIVER TELECOM.	381637	ND	14,324	$652	$369	$766	$283	$580	$652
W. WISCONSIN TELCOM	330971	WI	6,053	$1,290	$773	$775	$516	$546	$1,290
WABASH TEL COOP, INC	341088	IL	4,243	$787	$394	$701	$393	$887	$787
WAITSFIELD/FAYSTON	140069	VT	18,643	$538	$200	$211	$338	$284	$484

Study Area Name	SAC	State	Loops	Current CPL	Current Capex CPL	90% Capex CPL Estimate	Current Opex CPL	90% Opex CPL Estimate	CPL used to Determine Support
WALDRON TEL CO	310734	MI	481	$1,051	$296	$465	$755	$1,043	$1,051
WALNUT HILL TEL CO	401729	AR	4,351	$1,202	$274	$359	$928	$800	$1,074
WALNUT TEL CO, INC	351326	IA	682	$812	$387	$1,108	$425	$1,188	$812
WAMEGO TEL CO INC	411845	KS	4,672	$634	$251	$513	$383	$752	$634
WARREN TEL CO	100031	ME	1,226	$574	$156	$189	$418	$550	$574
WARWICK VALLEY-NJ	160135	NJ	5,688	$412	$183	$351	$230	$785	$412
WARWICK VALLEY-NY	150135	NY	9,336	$390	$192	$213	$198	$447	$390
WASHINGTON CTY RURAL	320834	IN	2,752	$751	$446	$634	$305	$672	$751
WAUNETA TEL CO	371597	NE	606	$1,998	$879	$584	$1,119	$1,109	$1,693
WAVERLY HALL, LLC	220392	GA	1,310	$905	$297	$711	$609	$1,121	$905
WEBB-DICKENS TEL	351327	IA	337	$2,488	$911	$2,012	$1,577	$1,828	$2,488
WEBSTER-CALHOUN COOP	351328	IA	4,117	$1,441	$1,064	$1,745	$377	$991	$1,441
WELLMAN COOP TEL	351329	IA	1,211	$760	$427	$723	$333	$922	$760
WEST CAROLINA RURAL	240550	SC	10,740	$1,804	$1,349	$1,190	$456	$802	$1,646
WEST CENTRAL TEL	361501	MN	3,502	$1,575	$1,013	$1,190	$562	$715	$1,575
WEST KENTUCKY RURAL	260421	KY	13,946	$926	$481	$528	$445	$515	$926
WEST LIBERTY TEL CO	351332	IA	3,257	$830	$489	$894	$341	$815	$830
WEST PENOBSCOT TEL	100034	ME	2,055	$363	$61	$140	$301	$408	$363
WEST RIVER COOP	391689	SD	3,420	$1,856	$1,269	$1,188	$587	$1,007	$1,775
WEST SIDE TEL-WV	200277	WV	2,340	$593	$177	$335	$416	$652	$593
WEST TENNESSEE TEL	290583	TN	3,255	$557	$248	$407	$309	$674	$557
WEST TEXAS RURAL TEL	442166	TX	1,895	$1,338	$203	$656	$1,135	$1,307	$1,338
WESTERN NEW MEXICO	492268	NM	6,217	$1,236	$478	$478	$757	$794	$1,236
WESTERN WAHKIAKUM	522451	WA	1,100	$2,022	$873	$749	$1,148	$1,378	$1,897
WES-TEX TEL CO-OP	442168	TX	2,255	$1,187	$429	$1,515	$758	$1,816	$1,187
WESTGATE dba WEAVTEL	520580	WA	20	$16,069	$6,404	$5,807	$9,666	$7,834	$13,641
WHEAT STATE TEL, INC	411847	KS	1,916	$1,096	$386	$501	$710	$1,033	$1,096
WHIDBEY TEL CO.	522452	WA	11,919	$560	$279	$301	$281	$420	$560
WIGGINS TEL ASSOC	462209	CO	1,511	$2,266	$1,468	$2,378	$799	$1,290	$2,266
WILKES MEMBERSHIP	230510	NC	9,723	$986	$636	$636	$349	$480	$986
WILKES TEL & ELC CO	220394	GA	9,354	$513	$211	$498	$303	$647	$513

Study Area Name	SAC	State	Loops	Current CPL	Current Capex CPL	90% Capex CPL Estimate	Current Opex CPL	90% Opex CPL Estimate	CPL used to Determine Support
WILLISTON TEL CO	240551	SC	3,979	$587	$220	$260	$367	$590	$587
WILSON TEL CO INC	411849	KS	1,803	$2,031	$730	$1,002	$1,300	$1,361	$2,031
WILTON TEL CO - NH	120050	NH	2,589	$417	$134	$218	$283	$473	$417
WINN TEL CO	310737	MI	648	$723	$102	$268	$621	$856	$723
WINNEBAGO COOP-IA	351337	IA	5,567	$930	$614	$861	$316	$745	$930
WINNEBAGO COOP-MN	361337	MN	680	$779	$615	$591	$164	$1,107	$755
WINTERHAVEN TEL. CO.	542323	CA	994	$801	$206	$511	$595	$1,779	$801
WITTENBERG TEL CO	330973	WI	2,083	$672	$276	$389	$396	$606	$672
WOLVERINE TEL CO	310738	MI	7,398	$383	$136	$237	$247	$375	$383
WOOD COUNTY TEL CO	330974	WI	17,391	$571	$255	$255	$316	$343	$571
WOODHULL TEL CO	341091	IL	577	$681	$296	$693	$384	$1,179	$681
WOODSTOCK TEL CO	361510	MN	1,152	$1,555	$657	$1,204	$898	$1,208	$1,555
WYANDOTTE TEL CO	432034	OK	625	$712	$355	$403	$358	$1,475	$712
XIT RURAL TEL CO-OP	442170	TX	1,280	$2,355	$1,450	$1,450	$905	$1,753	$2,355
YELCOT TEL CO INC	401733	AR	2,698	$904	$402	$587	$502	$882	$904
YUKON TEL CO INC	613025	AK	481	$648	$120	$399	$528	$1,655	$648
ZENDA TEL COMPANY	411852	KS	162	$1,383	$50	$682	$1,333	$2,473	$1,383

APPENDIX C

Specification for Study Area Boundary Submission

I. General

Carriers may submit study area maps if they believe that the boundaries used by the FCC are not representative. Maps must be submitted in ESRI compatible shapefile format such that each shapefile represents a single study area. The shapefile must contain one data record for each exchange that constitutes the study area. Each exchange should be represented as a closed, non-overlapping polygon with the associated data fields described below. Submitted boundaries must be accompanied by metadata or a plain text "readme" file containing the information listed below.

Since shapefiles typically consist of 3 to 9 individual files, the shapefile for the study area should be submitted as a single, zipped file containing all the component files. The shapefile and encapsulating zip file names must contain the company name and the 6-digit study area code. Shapefile and readme file templates are available at http://www.fcc.gov/encyclopedia/rate-return-resources.

Materials must be sent by hand or messenger delivery. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission. Attention: Lorenzo Miller, 202-418-0846 or John Emmett, 202-418-0386.

Hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.

Note that submitted boundaries are public data and may be used in published FCC documents and webpages.

II. Shapefile

A shapefile template is available at http://www.fcc.gov/encyclopedia/rate-return-resources. Submitted shapefiles must:

A. contain one closed, non-overlapping polygon for each exchange in the study area
B. have associated with each exchange polygon the following identifying data fields:
    1. OCN – NECA-assigned operating company number as in the LERG
    2. Company Name
    3. Exchange Name
    4. CLLI Code
    5. Study Area Code
    6. FRN (please use the FRN used for the 477 filing in the state)
C. have an assigned projection w/accompanying .prj file
D. use unprojected (geographic) WGS84 geographic coordinate system
E. have a minimum horizontal accuracy of +/- 40 feet or less, conforming to 1:24K national mapping standards
F. be submitted as a WinZip archive with a name containing the company name and study area code (e.g., CompanyName_123456.zip).

III. Readme File

A readme file template is available at http://www.fcc.gov/encyclopedia/rate-return-resources. The readme file accompanying submitted boundaries must be submitted as a plain text file with a name containing the relevant study area code (e.g., ReadMe_123456.txt). The readme file must contain the following information:

A. Contact person name
B. Contact person address
C. Contact person phone number
D. Contact person email address
E. Date created/revised
F. Methodology – process steps to create the data
G. Certification statement including the name and contact information for the certifying company officer.