

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the Matter of the Petition of Ace Telephone)
Company, Allendale Telephone Company,)
Barry County Telephone Company, Blanchard)
Telephone Company, Bloomingdale Telephone)
Company, Chippewa County Telephone Company)
Deerfield Farmers' Telephone Company,)
Hiawatha Telephone Company, Kaleva Telephone)
Company, Midway Telephone Company, Ogden)
Telephone Company, Ontonagon Telephone)
Company, Pigeon Telephone Company, the)
Upper Peninsula Telephone Company, Waldron)
Telephone Company, and Winn Telephone)
Company, For the Arbitration of Interconnection)
Rates, Terms and Conditions and Related)
Arrangements with Alltel Communications, Inc.)
Pursuant to Section 252(b) of the Federal)
Telecommunications Act of 1996)

Case No. U-14889

AFFIDAVIT OF W. CRAIG CONWELL

I, W. Craig Conwell, being of lawful age and duly sworn on oath, states that if called as a witness in this matter that I would be competent to testify to the following:

I have caused to be prepared the attached written testimony in the above referenced docket. This testimony is true and correct to the best of my knowledge, information, and belief.

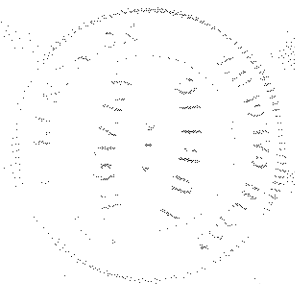
Further Affiant sayeth not.

W. G. Conwell

Subscribed and Sworn to before me
this 6 day of June, 2006.

[Signature]
Notary Public

My commission
expires January 17, 2013



STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the Matter of the Petition of Ace Telephone)
Company, Allendale Telephone Company,)
Barry County Telephone Company, Blanchard)
Telephone Company, Bloomingdale Telephone)
Company, Chippewa County Telephone Company)
Deerfield Farmers' Telephone Company,)
Hiawatha Telephone Company, Kaleva Telephone)
Company, Midway Telephone Company, Ogden)
Telephone Company, Ontonagon Telephone)
Company, Pigeon Telephone Company, the)
Upper Peninsula Telephone Company, Waldron)
Telephone Company, and Winn Telephone)
Company, For the Arbitration of Interconnection)
Rates, Terms and Conditions and Related)
Arrangements with Alltel Communications, Inc.)
Pursuant to Section 252(b) of the Federal)
Telecommunications Act of 1996)
_____)

Case No. U-14889

DIRECT TESTIMONY OF W. CRAIG CONWELL
ON BEHALF OF ALLTEL COMMUNICATIONS, INC.

Table of Contents

Topic	Page
Introduction and Qualifications	1
Summary of Testimony and Recommendations	3
Proposed Rates of Most Petitioners are Based on Cost Studies That This Commission Has Ordered Petitioners to Replace with New Studies Later this Month	11
The Role of ILEC Cost Studies and the ILEC Burden of Proof	14
FCC Requirements for Transport and Termination Rates	23
Review of Petitioners' Cost Studies and Proposed Rates	28
Cost Study Results and Proposed Rates	29
Usage-Sensitive End Office Switching	30
Other Issues in MECA 2 nd TSLRIC Cost Study	40
Cost Benchmarks	41
Conclusion	45

1 **INTRODUCTION AND QUALIFICATIONS**

2 **Q. Please state your name, business address and employer.**

3 A. My name is W. Craig Conwell. My business address is 405 Hammett Road,
4 Greer, South Carolina. I am self employed as an independent consultant,
5 specializing in telecommunications cost analysis.

6
7 **Q. On whose behalf are you testifying in this case?**

8 A. I am testifying as the cost witness for Alltel Communications, Inc. ("Alltel") in
9 connection with the Petition for Arbitration filed by members of the Michigan
10 Exchange Carriers Association ("MECA") with the Michigan Public Service
11 Commission ("the Commission" or "MPSC") against Alltel on May 14, 2006.¹

12
13 **Q. Please describe your educational background.**

14 A. I have a Bachelors degree (1972) and Master of Science degree (1974) in
15 Industrial Engineering from Auburn University in Auburn, Alabama.

16
17 **Q. Please describe your work background.**

18 A. I have included as Exhibit WCC-1 a copy of my current resume. I have over 30
19 years of experience in the telecommunications industry, with a broad background
20 in telecommunications costs analysis as an employee of the Bell System, with

¹ The "Petitioners" include Ace Telephone Co., Allendale Telephone Co., Barry County Telephone Co., Blanchard Telephone Co., Bloomingdale Telephone Co., Chippewa County Telephone Co., Deerfield Farmers' Telephone Co., Hiawatha Telephone Co., Kaleva Telephone Co., Midway Telephone Co., Ogden Telephone Co., Ontonagon Telephone Co., Pigeon Telephone Co., Upper Peninsula Telephone Co., Waldron Telephone Co. and Winn Telephone Co.

1 Arthur Andersen & Co. in its telecommunications consulting practice, and for the
2 past ten years as an independent consultant.

3
4 In recent years, I have been extensively involved in negotiations and arbitrations
5 of reciprocal compensation rates between incumbent local exchange carriers
6 (ILECs) and wireless carriers. I have analyzed numerous ILEC cost studies for
7 compliance with the FCC rules for Total Element Long Run Incremental Costs
8 (TELRIC), and I have testified as an expert cost witness on behalf of wireless
9 carriers in one or more arbitrations in five states.

10
11 I also was involved on behalf of the AT&T (previously SBC) local exchange
12 carriers in the arbitrations establishing rates for unbundled network elements and
13 collocation. I have provided expert testimony on one or more occasions in 12
14 states. Over the years, I have developed cost models, participated in the design of
15 telecommunications cost accounting systems, and taught service cost courses for
16 the United States Telephone Association and telephone company staffs.

17
18 **Q. What are the other arbitrations between incumbent LECs and wireless**
19 **carriers in which you participated?**

20 A. I was the cost witness for wireless carriers in two arbitrations in Oklahoma (Cause
21 Nos. PUD 200200150 and PUD 200300771), an arbitration in Tennessee (Docket
22 No. 03-00585), two arbitrations in Missouri (Case Nos. IO-2005-0468 and TO-
23 2006-0147) and the arbitration between MECA companies and Verizon Wireless

1 in Michigan (Case No. U-14678). I am currently involved in an arbitration in
2 California between rural ILECs and two wireless carriers (Cingular Wireless and
3 T-Mobile USA). In each case, my role is to review incumbent LEC cost studies
4 and their results to determine whether they meet the FCC requirements for
5 establishing reciprocal compensation rates.

6
7 **Q. What is your consulting engagement with Alltel in this case?**

8 A. Alltel engaged me to review the cost-related information, or “cost support,” for
9 the transport and termination rates proposed by the 16 incumbent LECs that filed
10 the Petition for Arbitration on May 14, 2006. The purpose of the review is to
11 determine whether the Petitioners have met the FCC requirements for establishing
12 transport and termination rates for traffic that originates on Alltel’s network and
13 terminates on the networks of the Petitioners – that is, mobile-to-land traffic and
14 whether their proposed rates are appropriate for reciprocal compensation. I will
15 also be addressing the direct testimony of Mr. David S. McCartney filed on behalf
16 of the Petitioners with the Petition for Arbitration.²

17
18 **SUMMARY OF TESTIMONY AND RECOMMENDATIONS**

19 **Q. Please summarize the main points of your testimony.**

20 A. My testimony will address the following points.
21

² “Direct Testimony of David S. McCartney,” Michigan Public Service Commission, Case No. U-14889, filed with Petition for Arbitration, May 14, 2006.

- All but three of the Petitioners (Chippewa County, Hiawatha and Winn) based their proposed transport and termination rates on cost studies that the Commission by order in Case No. U-14678 has determined must be revised and reexamined. The three remaining Petitioners although not parties in U-14678, suffer from similar defects. Therefore, the proposed cost-based rates of at least 13 of 16 Petitioners will be superceded by the new studies they are required to file within the next three weeks.

Twelve Petitioners in this arbitration relied entirely, for their proposed transport and termination rate (\$0.022465 per minute), on the MECA 2nd Total Service Long Run Incremental Cost Study (TSLRIC) Study. Upper Peninsula's proposed rate (\$0.039028 per minute) is based on a separate study. These are the same studies produced for the MECA-Verizon Wireless arbitration in U-14678, which the Commission ordered to be revised and reexamined. The new cost studies are required to be filed on June 30, 2006. If the studies are prepared in compliance with FCC rules and reflect current technologies, costs, *etc.*, the new studies will produce lower transport and termination costs and rates than Petitioners are seeking in this case. For example, when the studies are modified to remove usage-sensitive end office switching costs (other than interoffice trunk equipment costs) in compliance with decisions of this Commission, the rate based on the MECA TSLRIC study will be reduced from \$0.022465 to \$0.004359 per minute, or

1 approximately 4/10th of a cent per minute, even before other necessary
2 updates and corrections are made.³

- 3
- 4 • Petitioners have failed to meet their burden of proof. The entire TSLRIC
5 studies used by Mr. McCartney to “map” costs to rates have not been
6 produced for the record or provided to Alltel as required by FCC rules.
7 Instead, the Petitioners attempt to rely solely upon the Commission’s previous
8 approval of these studies. However, FCC Rule 51.505(e)(2) is clear that “The
9 record of any state proceeding in which a state commission considers a cost
10 study for purposes of establishing rates under this section shall include any
11 such cost study.” In this case particularly, with the TSLRIC studies being six
12 to seven years old and the Commission in U-14678 ordering new studies to be
13 filed, it is important for Alltel to have access to the cost models used to
14 produce the studies and documentation of key assumptions and input data.
15 The Petitioners have not provided or filed this required information.

- 16
- 17 • The Petitioners’ proposed transport and termination rates exceed their
18 forward-looking economic costs, which is not permitted by FCC Rule

³ A key issue raised in the MECA-Verizon Wireless arbitration was the portion of end office switching costs considered to be usage-sensitive and recovered in termination rates. The MECA 2nd TSLRIC Study and Upper Peninsular Study, completed in the 1999-2000 timeframe, assume substantial portions of end office switching costs to be usage-sensitive. In 2004, four to five years after the cost studies were performed and approved by the MPSC, the Commission determined for SBC-Michigan that there are no usage-sensitive end office switching costs and that end office switching costs are caused by lines (“Opinion and Order”, MPSC Case No. U-13531, 09/21/04, p. 40.) This same determination has been made by the FCC and other State commissions since the completion of the Petitioners’ cost studies. \$0.004360 = proposed rate of

1 51.505(e). Their proposed rates range from \$0.022465 - \$0.053435 per
2 minute. Simply removing end office switching costs that are non-usage
3 sensitive, consistent with orders of this Commission, the FCC and several
4 other State commissions, lowers the rates to a range of \$0.004359 - \$0.005550
5 per minute for the twelve Petitioners relying on the MECA 2nd TSLRIC Study
6 and Winn Telephone. The results of the studies of Chippewa County,
7 Hiawatha and Upper Peninsula are so suspect that similar comparisons are not
8 reasonable to make. These Petitioners however bear the burden to prove their
9 studies today produce valid forward-looking economic costs.

- 10
- 11 • Further, I provide cost benchmarks for ILEC transport and termination based
12 on publicly available information to demonstrate that the Petitioners' TSLRIC
13 study results overstate their forward-looking economic costs.

14

15 Based on these findings, I would like to offer five recommendations for
16 consideration by the arbitration panel and the Commission.

17

18 **Q. Please summarize your recommendations with respect to the Petitioners' cost**
19 **studies and proposed transport and termination rates.**

20 **A. My five recommendations are as follows:**

21

\$0.022465 - \$0.018105 for switching. The \$0.004360 still includes switching costs for interoffice trunking.

- 1 1. Given that the cost studies underlying the proposed rates of all Petitioners
2 (except Chippewa County, Hiawatha and Winn) are deficient, and as of June
3 30, 2006 will not be the Petitioners' latest costs studies, a decision on final
4 rates by the Commission should be postponed until studies that comply with
5 FCC rules are prepared, provided and filed for review and approved by the
6 Commission. Since the Chippewa County, Hiawatha and Winn cost studies
7 were produced in the same timeframe as the others and likely reflect similar
8 erroneous and cost inflating assumptions regarding the usage-sensitivity of
9 end office switching costs, a decision on final rates for these companies also
10 should be postponed. In the meantime, my testimony offers for the record
11 background on the FCC requirements for establishing transport and
12 termination rates and evidence regarding issues underlying the current
13 TSLRIC studies, which hopefully will be addressed in the new studies.
- 14 2. When the new cost studies are filed, documentation sufficient for review
15 should be provided to the Commission and Alltel. This necessarily must
16 include electronic copies of cost models and documentation of key
17 assumptions and input data used in the cost models.
- 18 3. Alltel should have the opportunity to review Petitioners' new cost studies,
19 participate fully and provide input to the Commission's review and approval
20 of the studies.
- 21 4. With respect to the past TSLRIC studies on which Petitioners' rely in this
22 proceeding, I have identified some defects and issues, but not all issues, since

1 complete documentation has not been provided. The following is
2 recommended in this case:

3 a. If the Petitioners disagree that current end office switching costs (other
4 than interoffice trunk equipment costs) are not usage-sensitive, they
5 should provide adequate documentation and analysis of vendor switch
6 engineering, pricing and other relevant data to substantiate the portion of
7 end office switching considered to be usage-sensitive and recoverable in
8 termination rates.

9 b. Chippewa County and Upper Peninsula should provide detailed support
10 showing the derivation of local transport –termination and facilities costs.
11 This support should identify the key drivers underlying the costs (cable
12 sizes and lengths, transmission equipment size and components, cable and
13 transmission equipment costs and sources, capacities and total demand,
14 *etc.*)

15 c. Hiawatha Telephone should provide similar detailed support showing the
16 derivation of host-remote – termination and facilities costs.

17 d. All Petitioners should provide support for local usage measurement costs.

18 The documentation described in items 4.a–d relates to areas of the current
19 TSLRIC studies that require substantiation. This does not imply that complete
20 documentation is not required for the new cost studies filed on June 30th.

21 5. Until new and compliant cost studies are filed, subjected to a proper
22 proceeding, the Petitioners meet their burdens of proof and final rates
23 approved, a bill-and-keep arrangement should continue to be used for the

1 exchange of traffic between the Petitioners and Alltel. Alternatively, an
2 interim transport and termination rate equal to the rate proposed by Alltel of
3 \$0.006038 per minute should be used. The transport and termination costs of
4 Winn and the twelve Petitioners relying on the MECA 2nd TSLRIC Study
5 range from 4/10th – 6/10th of a cent, after removing non-usage sensitive end
6 office switching costs. Alltel's proposed rate is in line with these costs and
7 would serve as a reasonable interim rate, until the Petitioners meet their
8 burden of proof. For Chippewa County, Hiawatha and Upper Peninsula, I
9 recommend an interim rate of \$0.009 per minute, which is the upper end of
10 the range of transport and termination cost benchmarks that I will describe
11 later in my testimony.

12
13 **Q. Is your primary argument with the Petitioners' TSLRIC studies that they**
14 **are outdated?**

15 A. No. The fact that the studies are many years out of date is not the only critical
16 defect. The overarching concern is that the studies do not comply with FCC rules,
17 and the results of the studies do not reasonably reflect the Petitioners' forward-
18 looking economic costs at the present, when rates are being established. The only
19 way to prove that a study's results represent today's forward-looking economic
20 costs to transport Alltel's telecommunications traffic is by reviewing the
21 underlying cost models and basis for key assumptions and input data. However,
22 all of the necessary information has not been provided to Alltel or filed in this
23 proceeding.

1

2 The Minnesota Public Service Commission recognized this in addressing usage-
3 sensitive end office switching, an issue I will raise with respect to the Petitioners'
4 cost studies. The Minnesota Commission stated:

5

6

7

8

9

10

11

12

The new unbundled network element rates are based on a current record, exhaustive evidentiary proceedings, and the recommendations of two Administrative Law Judges. They are a much more accurate reflection of the current costs of telecommunications features and functions than the original rates, which were set on the basis of a 1998 evidentiary record and 1998 telecommunications technologies.

13

14

15

16

17

18

19

20

This results in a new zero rate for one element of reciprocal compensation, end-office switching, due to the adoption of flat-rate pricing for the local switching element. Under the flat rate pricing framework adopted by the Commission on the recommendation of the Administrative Law Judges, all costs arguably associated with end-office switching are recovered through other rates. Flat-rate pricing, and the resulting zero rate for end-office switching, are just and reasonable for the reasons set forth below.

21

* * *

22

23

24

25

26

27

Here, the Commission has just completed a lengthy [UNE] proceeding in which one of the constituent parts of reciprocal compensation, end-office switching, has been significantly repriced on the basis of current cost information. It is clearly just, reasonable, and in the public interest to adjust that rate element on the basis of this new cost data.

28

* * *

29

30

31

32

33

For all these reasons, the Commission will adjust the end-office switching component of Minnesota's reciprocal compensation rates to zero to reflect the new unbundled network element switching rate set for that function in the recently completed cost proceeding.⁴

34

⁴ *Investigation into Reciprocal Compensation Rates*, Docket No. P-421/CI-03-384, 2003 Minn. PUC LEXIS 99 (Sept. 24, 2003).

**PROPOSED RATES OF MOST PETITIONERS ARE BASED ON COST
STUDIES THAT THIS COMMISSION HAS ORDERED PETITIONERS TO
REPLACE WITH NEW STUDIES LATER THIS MONTH**

Q. How many cost studies are referenced by the Petitioners?

A. There are five cost studies currently at issue in this arbitration. The first study is the MECA TSLRIC Study of April, 2000 (“2nd TSLRIC Study”). The results of this study were used to develop the proposed transport and termination rates for all but four companies – Chippewa County, Hiawatha, Upper Peninsula and Winn.⁵ This study was originally produced in 1999 and modified in 2000. The remaining four ILECs each refer to separate cost studies.⁶ The Chippewa County and Hiawatha studies were produced in 1999; the Upper Peninsula study in 2000; and the Winn study in 2001-2002.

Q. Were any of these cost studies used by the Petitioners in the MECA – Verizon Wireless arbitration in Case No. U-14678?

A. Yes, in U-14678 there were two cost studies used to develop the proposed rates of the nine Petitioners.⁷ The cost study used by all but one of the Petitioners again was MECA’s 2nd TSLRIC Study. The second cost study was one prepared by Upper Peninsula.

⁵ *Id.*, Exhibit DSM-2. The exhibit shows only the MECA 2nd TSLRIC Study results for transport and termination elements and the calculation (“mapping”) of cost-based rates from these results. The exhibit does not provide documentation of the cost study.

⁶ *Id.*, Exhibits DSM-3, DSM-4, DSM-5 and DSM-6. Again, these exhibits do not provide cost study documentation.

1

2 **Q. Were the Chippewa County, Hiawatha and Winn cost studies used in the**
3 **Verizon Wireless arbitration?**

4 A. No, these companies were not petitioners in U-14678.

5

6 **Q. Did the Commission in U-14678 question continued validity of the MECA 2nd**
7 **TSLRIC Study and the Upper Peninsula TSLRIC Study?**

8 A. Yes. In its February 21, 2006 order, the Commission agreed with the arbitration
9 panel's recommendation that new cost studies be filed. The Commission stated as
10 follows:

11

12 However, the arbitration panel noted that the Commission's
13 findings concerning usage sensitive and end office switching costs
14 subsequent to the approval of the petitioners' TSLRIC studies
15 might be considered a sufficient change in circumstances to
16 warrant a new cost study application by the petitioners. Therefore,
17 the arbitration panel recommended that the Commission direct the
18 petitioners to file, within 30 days of the date of the final order in
19 this case, a new cost study either jointly or separately and require
20 the agreement to provide for the inclusion of new rates when the
21 cost study is approved.⁸

22

23 The Commission then ordered that:

24

25 B. A proceeding is commenced in Case No. U-14781 to
26 investigate and review the total service long run incremental costs
27 of the petitioners.

⁷ The Petitioners in U-14678 were Ace Telephone Co., Barry County Telephone Co., Deerfield Farmers' Telephone Co., Kaleva Telephone Co., Lennon telephone Co., Ogden Telephone Co., Pigeon Telephone Co., Upper Peninsula Telephone Co. and Waldron Telephone Co.

⁸ Order in Case Nos. U-14678 and U-14781, Michigan Public Service Commission, February 21, 2006.

1 C. The petitioners are directed to file documents and testimony by
2 June 30, 2006 in Case No. U-14781 to support cost studies of their
3 total service long run incremental costs.
4

5 **Q. What were “the Commission’s findings concerning usage sensitive and end**
6 **office switching costs” that warranted new TSLRIC studies?**

7 A. The MECA 2nd TSLRIC Study and Upper Peninsula TSLRIC Study completed in
8 1999-2000 treat substantial portions of switching costs as usage-sensitive and
9 include these costs in the transport and termination rate. For example, the MECA
10 study treats all host and remote switch investment as usage-sensitive, except the
11 investment in line equipment. Specifically, the switch “base cost” (typically the
12 switch processor, memory and other “getting started costs”), software, power and
13 other common costs are attributed entirely to usage. In its September, 2004 order
14 after reviewing SBC Michigan’s costs of telecommunications services, the
15 Commission found that there are no usage-sensitive costs of end office switching.
16 It stated as follows:

17 The Commission finds that there are no usage sensitive costs
18 associated with end-office switching and that the switched access
19 local switching costs per MOU should be set to zero. Likewise,
20 the Commission finds that for local calls subject to reciprocal
21 compensation charges placed to UNE-P customers, the end-office
22 switching costs should be set at zero.⁹
23
24

25 The Commission’s findings in U-13531 followed the MECA and Upper Peninsula
26 studies by four or more years. It is my understanding that the arbitration panel

⁹ *In the matter, of the Commission’s own motion, to review the costs of telecommunications services provided by SBC Michigan*, Opinion and Order, Case No. U-13531, September 21, 2004, p. 40.

1 and Commission felt it was necessary to take another look at the Petitioners' end
2 office switching costs.

3

4 **Q. Had Chippewa County, Hiawatha and Winn been petitioners in the Verizon**
5 **Wireless case might they also be required to file new studies?**

6 A. Yes. I believe these Petitioners would have been required and should now be
7 required to file new studies. Their studies also precede the Commission's finding
8 in U-13531, and they also include substantial end office switching costs.¹⁰

9

10 **Q. What is the significance of the Commission's decision in U-14678 to have the**
11 **petitioners, in that case, file new studies for review and approval?**

12 A. Both the arbitration panel and the Commission recognized and acknowledged the
13 potential deficiency with the studies. The forward-looking economic costs used
14 as the basis for the proposed transport and termination rates in this arbitration for
15 all but three Petitioners are subject to change depending on the Commission's
16 investigation in U-14781.

17

18 **THE ROLE OF ILEC COST STUDIES AND THE ILEC BURDEN OF PROOF**

19 **Q. Why are the incumbent LEC cost studies important in this arbitration**
20 **proceeding?**

21 A. FCC Rule 51.705(a)(1) specifies that an "incumbent LEC's rates for transport and
22 termination of telecommunications traffic shall be established" on the basis of the

¹⁰ Chippewa County, Hiawatha and Winn proposed local switching rates ranging from \$0.012408 to \$0.030043 per minute.

1 “forward-looking economic costs of such offerings, using a cost study pursuant to
2 Sec. 51.505 and 51.511.” FCC Rule 51.505(e), in turn, provides:

3 An incumbent LEC must prove to the state commission that the
4 rates for each element it offers do not exceed the forward-looking
5 economic cost per unit of providing the element, using a cost study
6 that complies with the methodology set forth in this section and
7 Sec. 51.511.
8

9 **Q. Are there parts of Rule 51.505(e) that merit highlighting?**

10 A. Yes. Three parts of this rule should be emphasized. First, an incumbent LEC’s
11 rates for transport and termination must “not exceed” its forward-looking
12 economic cost of providing transport and termination. Second, it is the incumbent
13 LEC that has the burden of proof. Each Petitioner in this arbitration has the
14 burden to demonstrate that its proposed rate for transport and termination does
15 “not exceed the forward-looking economic cost” of providing transport and
16 termination. In this case, given the age of the TSLRIC studies, the Petitioners
17 must also demonstrate that the proposed rates do not exceed today’s forward-
18 looking economic costs. As the FCC has stated, “Given the likely asymmetry of
19 information regarding network costs, we conclude that, in the arbitration process,
20 incumbent LECs shall have the burden to provide the specific nature and
21 magnitude of these forward-looking common costs.”¹¹ Third, under FCC Rule
22 51.505(e), the Petitioners must meet their burden of proof through use of “a cost
23 study that complies with the methodology set forth in this section and Sec.
24 51.511.”
25

¹¹ *Local Competition Order*, 11 FCC Rcd 15499, 15852 ¶ 695 (1996).

1 **Q. Can you give an example of how the Petitioners would be expected to meet**
2 **this burden of proof?**

3 A. Yes, the local switching component of the transport and termination rate provides
4 a good example. Local switching represents 88 percent of the \$0.022465 per
5 minute rate proposed by 12 of the Petitioners using the MECA 2nd TSLRIC Study.
6 While there are numerous assumptions and input data used in calculating local
7 switching costs, the most important are the following:

- 8 • *Current switching technology* – the assumption of traditional circuit
9 switches, packet switches or some combination.
- 10 • *Current cost to purchase and install a new switch*, given current vendor
11 price structure (*e.g.*, component vs. per-line pricing), prices, discounts, *etc.*
- 12 • *Software costs* (basic system generic software, features, *etc.*) included in
13 switching and the accounting treatment of this software (capitalized or
14 expensed).
- 15 • *Usage-sensitive portion of switching costs*, based on an analysis of current
16 switch technology, drivers of capacity and costs.
- 17 • *Switching economic life*.
- 18 • *Annual switch maintenance and shared expenses*.
- 19 • *Annual common cost allocation*.

20

21 To meet their burden of proof with respect to local switching costs, the Petitioners
22 are required to specify the forward-looking technology they expect to deploy for
23 end office switching. This forward-looking view was certainly different in the

1 1999-2000 timeframe, when the Petitioners' cost studies were performed, versus
2 today. The Petitioner must document the basis for the current cost to purchase
3 and install switching systems, including sources of information, such as vendor
4 quotes or the output of vendor-provided software for construction estimates.
5 Since the FCC rules require that forward-looking costs be directly attributable to
6 network elements, the Petitioner must demonstrate that software costs are indeed
7 necessary for transport and termination and not other services. Switch pricing and
8 software also have decreased since the Petitioners' cost studies were produced.
9 Later, I will describe the issue of the usage-sensitive portion of switching costs.
10 This is perhaps the most important, and in this case most erroneous, of the
11 assumptions underlying the local switching costs, and it is imperative that the
12 Petitioners identify and prove whatever assumptions they make with credible data
13 and analysis.
14

15 **Q. Is it practical for a rural ILEC to provide such cost support?**

16 A. Yes, it is. Transport and termination cost studies for rural ILECs do not need to
17 be nearly as complicated as the studies of a Regional Bell Operating Company
18 (RBOC) or large independent telephone company. Rural ILECs typically have
19 few end office switches, a single interoffice transport link to the transit carrier,
20 and a host-remote ring or few point-to-point interoffice circuits. In my
21 experience, relatively straightforward Excel models can be prepared to determine
22 these costs. Transport and termination does not involve the determination of loop
23 costs, which is much more complex. The portion of the Keisling Consulting cost

1 model used to produce switching and transport costs for the MECA 2nd TSLRIC
2 Study is not large.

3
4 Petitioners have failed to provide or file the supporting documentation to
5 demonstrate that the key assumptions and input data used in the model are
6 company-specific, forward-looking as of 2006 and in compliance with FCC Rules
7 51.505 and 51.511. Providing documentation of key study assumptions and input
8 data, as I illustrated for local switching, is not burdensome.

9

10 **Q. You mentioned that cost studies should be company-specific. Do FCC Rules**
11 **require transport and termination costs and rates to be company-specific?**

12 A. FCC Rule 51.505(e) requires company-specific costs. It states that “An
13 incumbent LEC must prove to the state commission that the rates for each
14 element it offers do not exceed the forward-looking economic cost per unit of
15 providing the element ...” They must prove that the rate does not exceed the
16 costs of “each element it offers.”

17

18 **Q. Do transport and termination costs vary among rural ILECs?**

19 A. Yes, they do. Switching costs can vary significantly among rural ILECs due to
20 switch size and the mix of host and remote switches. Generally, there is a
21 substantial getting started cost for a new switch, and the average cost per line will
22 vary depending on the quantity of lines and whether the switch is a host or
23 remote. Thus, an ILEC with smaller switches (in terms of lines) will have higher

1 costs per line.¹² Transport costs may vary significantly due to interoffice cable
2 lengths, cable sizes, the extent of cable sharing (with loop concentrators and other
3 uses), *etc.*

4
5 **Q. Is it burdensome for the Petitioners to produce company-specific costs?**

6 A. In my opinion, it is not. As I mentioned before, transport and termination cost
7 studies for rural ILECs are not as complicated as studies for large companies or
8 studies that involve loops. Furthermore, it appears that the MECA 2nd TSLRIC
9 Study is based on an aggregation of individual company network and other data,
10 which was entered in the Keisling Consulting cost model. To produce company-
11 specific studies, the individual company network data (*e.g.*, cable routes, cable
12 lengths, trunk quantities, *etc.*) could be used as before, with company-specific
13 assumptions and input data on their forward-looking plant technologies and costs.

14
15 **Q. Do FCC Rules require LECs to file their cost studies in the record of this**
16 **proceeding?**

17 A. Yes, FCC Rule 51.505(e)(2) states: “The record of any state proceeding in which
18 a state commission considers a cost study for purposes of establishing rates under
19 this section shall include any such cost study.”

20
21 **Q. Have the Petitioners filed their cost studies in this proceeding or provided**
22 **them to Alltel?**

¹² However, if end office switching costs are properly limited to the usage-sensitive costs of interoffice trunk equipment, the costs vary little due to switch size.

1 A. They have not filed them, and I am advised they have not provided the entire
2 studies to Alltel. Mr. McCartney's direct testimony describes the "mapping" of
3 cost study results to compute proposed transport and termination rates. However,
4 his testimony does not include the TSLRIC models and documentation of the
5 underlying key assumptions and input data.

6

7 **Q. Has Alltel been provided the cost studies for review?**

8 A. I was advised Petitioners provided Alltel with paper copies of portions of the
9 Keisling Consulting cost model used to produce MECA's 2nd TSLRIC Study.
10 Some cost study documentation also was provided with respect to the four
11 Petitioners relying on individual studies (Chippewa County, Hiawatha, Upper
12 Peninsula and Winn). However, documentation was not complete and was not
13 provided on key assumptions and input data. Using the earlier local switching
14 example, documentation has not been provided on the cost to purchase and install
15 switches in 2006, the basis for determining the usage-sensitive portion of
16 switching, *etc.* Without this key data it is not possible for Petitioners to support
17 their costs or for Alltel to analyze their studies.

18

19 **Q. What documentation must an incumbent LEC include in its cost study?**

20 A. The FCC has held that an incumbent LEC cost study "must explain with
21 specificity why and how specific functions are necessary to provide network
22 elements and how the associated costs are developed."¹³ An incumbent LEC

¹³ *Local Competition Order*, 11 FCC Rcd at 15850 ¶ 691.

1 “must prove to the state commission the nature and magnitude of any forward-
2 looking costs that it seeks to recover in the prices of interconnection and
3 unbundled network elements.”¹⁴ The documentation should include an electronic
4 copy of the cost model so that cost calculations can be traced and methods
5 verified as consistent with FCC Rules 51.505 and 51.511; and, documentation
6 should “explain with specificity” the basis for key assumptions and input data.
7

8 **Q. What are the Commission’s obligations in developing a rate for transport**
9 **and termination?**

10 A. As noted above, FCC Rule 51.505(e) specifies that an incumbent LEC’s
11 reciprocal compensation rate must “not exceed” its forward-looking economic
12 costs of transport and termination. To make this determination, FCC Rule
13 51.505(e)(2) specifies that the Commission shall create “a written factual record
14 that is sufficient for purposes of review.”
15

16 **Q. On pages 11-12 of his testimony filed with the MECA Petition for**
17 **Arbitration, Mr. McCartney states that “Petitioners’ proposed rates ... are**
18 **based on and equal to those that the applicable MPSC-approved TSLRIC**
19 **studies support.” Does previous Commission approval of the Petitioners’**
20 **TSLRIC studies eliminate the need for “a written factual record that is**
21 **sufficient for purposes of review” or satisfy the Petitioners’ burden of proof?**

¹⁴ *Id.* at 15847 ¶ 680. *See also id.* at 15852 ¶ 695 (“[I]n the arbitration process, incumbent LECs shall have the burden to prove the specific nature and magnitude of these forward-looking common costs.”).

1 A. It does not. Prior Commission approval of a study, especially one produced six to
2 seven years ago, does not satisfy the need for adequate documentation or the
3 Petitioners' burden of proof.¹⁵ The Commission's order in U-14678 for the
4 petitioners in the MECA-Verizon Wireless arbitration (eight of which are parties
5 to this arbitration) to "file documents and testimony ... to support costs studies of
6 their total service long run incremental costs" indicates a recognition that
7 technologies and costs have changed, such that it is not sufficient to take official
8 notice of cost studies previously approved.

9
10 The FCC has been clear regarding the requirements for cost support. In the
11 Virginia Arbitration Cost Order, it stated:

12
13 [A] cost model must include the capability to examine and modify
14 the critical assumptions and engineering principles. Underlying
15 data must be verifiable, network design assumptions must be
16 reasonable, and model outputs must be plausible. All data,
17 formulas, and other aspects of the models must be made available
18 to other parties for their evaluation. In other words, a cost model
19 must be transparent and verifiable.

20
21 Virginia Arbitration Cost Order, 18 FCC Rcd 17742-43 ¶ 38,
22 17747 ¶ 48 (2003).
23

24 **Q. Have the Petitioners met their burden of proof per the FCC rules?**

25 A. No, they have not. Mr. McCartney's testimony contains only what he refers to as
26 the "mapping" calculations to convert the cost results of the TSLRIC studies to
27 cost-based rates. This mapping is merely a set of simple calculations to add

¹⁵ MECA's 2nd TSLRIC Study on which the proposed rates of 12 Petitioners are based was performed in 1999 and 2000. The Chippewa County, Hiawatha, Upper Peninsula and Winn studies were produced between 1999 and 2002. (See McCartney Direct, page 8.)

1 common costs to the study results, convert costs from a per-seizure minute basis
2 to a per-conversation minute basis and aggregate the results to rate elements.
3 Neither his testimony nor the cost study materials provided to Alltel provide
4 information demonstrating that the study results on which the proposed rates are
5 based are representative of the Petitioners' forward-looking economic costs in
6 2006.

7
8 **Q. Due to the incomplete data provided by Petitioners, is it possible to**
9 **determine whether their proposed rates exceed their forward-looking**
10 **economic costs?**

11 A. Yes. As I will describe shortly, even with the limited documentation, it is clear
12 that the Petitioners' proposed rates exceed their forward-looking economic costs.

13
14 **FCC REQUIREMENTS FOR TRANSPORT AND TERMINATION RATES**

15 **Q. What are the requirements for cost-based reciprocal compensation rates?**

16 A. FCC Rule 51.705(a)(1) permits an incumbent LEC to charge reciprocal
17 compensation to recover the costs for two elements involved in handling traffic
18 originating on other carriers' networks: (1) transport, and (2) termination.
19 Transport and termination rates are to be based on forward-looking economic
20 costs, which the FCC defines in Rule 51.505 as the sum of total element long-run
21 incremental cost ("TELRIC") and a reasonable allocation of forward-looking
22 common costs. As also noted earlier, FCC Rule 51.505(e) imposes on the
23 incumbent LECs the burden of proving that their rates for transport and

1 termination do “not exceed the forward-looking economic cost per unit” of
2 providing each of these elements.

3
4 **Q. Are you aware that TSLRIC is the basis for transport and termination rates**
5 **established by the MPSC?**

6 A. Yes, I understand in Michigan cost studies used as the basis for transport and
7 termination rates are to reflect TSLRIC. I also understand that TSLRIC and
8 TELRIC methodologies produce the same measures of costs. Mr. McCartney
9 also indicated that “Michigan’s TSLRIC Study methodology conforms to the
10 Federal Communications Commission’s Total Element Long-Run Incremental
11 Cost (“TELRIC” Study).¹⁶

12
13 **Q. How does the FCC define transport?**

14 A. The FCC defines transport in Rule 51.701(c) as “the transmission and any
15 necessary tandem switching of telecommunications traffic subject to section
16 251(b)(5) of the Act from the interconnection point between the two carriers to
17 the terminating carrier’s end office that directly serves the called party, or
18 equivalent facility provided by a carrier other than an incumbent LEC.” Since
19 Alltel and the Petitioners interconnect indirectly, transport includes the interoffice

¹⁶ *Id.*, page 9.

1 cable and transmission equipment connecting the LECs' end offices to the "meet
2 point" where they connect to a transit carrier's network.¹⁷

3
4 **Q. How does the FCC define termination?**

5 A. The FCC defines termination in Rule 51.701(d) as "the switching of
6 telecommunications traffic at the terminating carrier's end office switch, or
7 equivalent facility, and delivery of such traffic to the called party's premises."
8 Congress has specified that incumbent LECs may recover in their transport and
9 termination rates only "the additional costs of terminating such calls." 47 U.S.C.
10 § 252(d)(2)(A)(ii). The FCC has interpreted this "additional cost" standard as
11 limiting recovery to usage-sensitive costs. Thus, the portions of an end office
12 switch that are not usage-sensitive are not recoverable in transport and
13 termination rates, and an incumbent LEC must recover these non-usage sensitive
14 switch costs from other sources (*e.g.*, end user customers).¹⁸ In addition, the costs
15 of loops from the end office to a customer's premises are not usage-sensitive and
16 therefore are not recoverable in reciprocal compensation.¹⁹

17
18 **Q. What are the specific requirements for determining the TELRIC of**
19 **transport and termination and a reasonable allocation of forward-looking**
20 **common costs?**

¹⁷ FCC rules define a "meet point" as "a point of interconnection between two networks, designated by two telecommunications carriers, at which one carrier's responsibility for service begins and the other carrier's responsibility ends." 47 C.F.R. § 51.5.

¹⁸ *Local Competition Order*, 11 FCC Rcd at 16025 ¶ 1057.

1 A. FCC Rules 51.505(b) and (c) define TELRIC and forward-looking common costs.
2 The FCC has described specific requirements related to calculating these costs
3 including the following:

4 • *Plant is to reflect forward-looking technology and costs.* The costs of
5 switching, transmission and cable plant are to reflect currently available
6 equipment, at current vendor prices and company-specific discounts. FCC
7 Rule 51.505(d)(1) specifically prohibits the use of embedded or historical
8 costs. For example, the cost study should reflect today's cost to construct a
9 new end office switching system, representing the prices the incumbent LEC
10 would currently pay its switch vendor to engineer, furnish and install the new
11 switch. The study should not reflect switch costs that are either outdated or
12 based on the original cost of existing switches. This requirement is especially
13 important in light of declining switch costs over the past six to seven years.

14
15 • *End office switching costs must reflect only the usage-sensitive portion of*
16 *switching plant.* The LEC must determine the portion of the costs of
17 purchasing and installing new switching systems caused by the minutes of
18 use, or call attempts, handled by the switches. This requires analyzing the
19 hardware, software and other charges for new switches, identifying fixed
20 charges versus charges affected by the volume of demand (lines, interoffice
21 minutes of use, etc.), and categorizing the charges accordingly. Only the
22 portion of the total cost of a new switch attributable to usage may be included

¹⁹ Loop plant capacity and costs are determined by the number of access lines or other local channels required to provide connections between customer premises and serving wire centers.

1 in end office switching costs; the portion of switch costs that does not vary
2 with usage may not be included in reciprocal compensation rates.

- 3
- 4 • *Plant capacity is to reflect an efficient network configuration.* FCC Rule
5 51.505(b)(1) specifies that the transport and termination technologies in the
6 cost study should use “the most efficient telecommunications technology
7 currently available and the lowest cost network configuration, given the
8 existing location of the incumbent LEC’s wire centers.” In addition, the
9 capacities of switching, transmission and cable plant in the study should be
10 sized for efficient forward-looking utilization. Transmission equipment and
11 cables used for interoffice transport, for example, should not be sized so large
12 in the cost study as to produce excessive spare capacity and costs. This would
13 cause transport costs to exceed forward-looking economic costs, which Rule
14 51.505(e) prohibits.

- 15
- 16 • *Support asset costs and operating expenses are to be forward-looking,*
17 *efficiently sized and directly attributable to transport and termination.*
18 Support assets include land, buildings, power equipment and other plant used
19 to house and operate switching systems and transport equipment. In a
20 TELRIC study, these assets are to be sized to support today’s technologies,
21 rather than representing existing land, buildings and other assets acquired to
22 support operations and plant in the past. At the same time, support asset costs
23 are to reflect current, rather than embedded land, building and other costs.

1 Similarly, operating expenses for repair and maintenance of switching and
2 transport equipment, engineering, network administration, *etc.* are to reflect
3 today's business processes, productivity and labor costs. To the extent
4 support assets or various workgroups are employed in producing other
5 products, their costs should be attributed to those products and not to transport
6 and termination. [47 C.F.R. §51.505]

- 7
- 8 • *Common costs are to be forward-looking and efficiently incurred.* Common
9 costs typically include executive, legal, accounting and other general and
10 administrative costs. These costs may be shared among all products and
11 services. FCC rules call for a reasonable allocation of these costs to be added
12 to the TELRIC of transport and termination in setting reciprocal compensation
13 rates. [47 C.F.R. §51.505].
- 14

15 **Q. Do these same requirements apply to a TSLRIC study?**

16 A. Yes, a TSLRIC study has these same requirements.

18 **REVIEW OF PETITIONERS' COST STUDIES AND PROPOSED RATES**

19 **Q. How have you organized your testimony regarding the Petitioners' cost**
20 **studies and proposed rates?**

21 A. This portion of my testimony has four parts. First, I describe the results of the
22 Petitioner cost studies and the proposed rates, highlighting the most important
23 elements. Second, because of the importance of the issue of usage-sensitive end

office switching costs, I provide evidence indicating that little, if any, end office switching costs are today usage-sensitive and recoverable in transport and termination rates. I also modify the Petitioners' proposed rates to remove the portions of switching costs that are not usage-sensitive. Third, I summarize other issues in the MECA 2nd TSLRIC Study causing the results to be overstated. Fourth, I provide benchmark costs, based on publicly available cost information, which complies with the FCC rules for forward-looking economic costs. These benchmarks indicate that the Petitioners' proposed rates exceed their forward-looking economic costs and are too high.

Cost Study Results and Proposed Rates

Q. What are the results of the Petitioners' cost studies and the resulting transport and termination rates?

A. Table 1 shown below summarizes the TSLRICs, plus common costs, from the five Petitioner cost studies. The "Total" column indicates Petitioners' proposed transport and termination rates.

Table 1 - Petitioners' Proposed Transport and Termination Rates

Petitioners	TSLRIC + Common Costs / Conversation Minute				Switching % of Total
		Local	Local		
	Local Switching	Transport - Termination	Transport - Facilities	Total	
Chippewa County Telephone	\$ 0.012408	\$ 0.006112	\$ 0.034915	\$ 0.053435	23%
Hiawatha Telephone	\$ 0.030043	\$ 0.003694	\$ 0.001813	\$ 0.035550	85%
Upper Peninsula Telephone	\$ 0.020479	\$ 0.011532	\$ 0.007017	\$ 0.039028	52%
Winn Telephone	\$ 0.018288	\$ 0.001265	\$ 0.001784	\$ 0.021337	86%
Twelve Other Petitioners (MECA 2nd TSLRIC Study)	\$ 0.019705	\$ 0.001472	\$ 0.001288	\$ 0.022465	88%

1 **Q. What should be noted regarding these results?**

2 A. First, the proposed transport and termination rates range from approximately 2.1
3 cents per minute for Winn Telephone to 5.3 cents for Chippewa County. Twelve
4 of the Petitioners have not performed company-specific studies as required by
5 FCC rules and rely on the same average cost study, resulting in a rate of 2.2 cents
6 per minute.

7

8 Second, for most Petitioners local switching costs make-up the majority of the
9 proposed rate – 85 percent or more. The cost of transporting mobile-to-land
10 traffic from the meet point with the transit carrier to the Petitioners' host or
11 standalone switch is relatively small. Most of the cost is associated with the end
12 office switches. In absolute terms, the cost of transport (termination and
13 facilities) for all but Chippewa County and Upper Peninsula are less than 6/10ths
14 of a cent. Excluding Hiawatha, the cost is less than 3/10ths of a cent.

15

16 Consequently, the areas where it is most necessary for Petitioners to prove the
17 validity of their costs are: (1) local switching costs, (2) the transport costs of
18 Chippewa County and Upper Peninsula, and (3) the host-remote transport costs of
19 Hiawatha included above in "Local Switching."

20

21 **Usage-Sensitive End Office Switching**

22 **Q. Why is the usage-sensitive portion of end office switching costs important?**

1 A. Section 252(d)(2)(A)(ii) of the Communications Act permits an incumbent LEC
2 to recover in its reciprocal compensation rates “the additional costs of terminating
3 [mobile-to-land] calls.” As noted earlier, the FCC has held that under this
4 “additional cost” standard, incumbent LECs may recover in reciprocal
5 compensation only the usage-sensitive portion of their end office switch costs
6 (and not the non-traffic sensitive costs).²⁰ This means that Petitioners’ transport
7 and termination rates may recover only those costs of a new switch that are
8 caused by usage. Any new switch costs that remain the same regardless of usage
9 cannot be recovered through Petitioners’ transport and termination rates.
10 Accordingly, the Petitioners have the burden of demonstrating what portion of
11 new switch costs would be attributable to usage.

12
13 **Q. What portion of the costs in the column labeled “Local Switching” in Table 1**
14 **would be the Petitioners’ estimate of usage-sensitive costs of the end office**
15 **switch?**

16 A. The following table provides a further breakdown of local switching costs based
17 on cost information provided in the Exhibits DSM-2 to DSM-6 of Mr.
18 McCartney’s direct testimony. The column labeled Switching represents the

²⁰ See *Local Competition Order*, 11 FCC Rcd 15499, 16025 ¶ 1057 (1996)(“We conclude that such non-traffic sensitive costs should not be considered ‘additional costs’ when a LEC terminates a call that originated on the network of a competing carrier. For the purposes of setting rates under section 252(d)(2), only that portion of the forward-looking, economic costs of end-office switching that is recovered on a usage-sensitive basis constitutes an ‘additional cost’ to be recovered through termination charges.”); *Local Competition Reconsideration Order*, 11 FCC Rcd 13042, 13045 ¶ 6 (1996)(“[T]he ‘additional cost’ to the incumbent LEC of terminating a call that originates on another network includes only usage-sensitive costs . . . but not the non-traffic sensitive costs Such non-traffic-sensitive costs, by definition, do not vary in proportion to the number of calls terminating over the LEC’s facilities and, thus, are not ‘additional costs.’”).

usage-sensitive portion of end office switching.²¹ These costs range from \$0.012408 to \$0.018105 per minute.

Table 2 - Local Switching Cost Elements

Petitioners	TSLRIC + Common Costs / Conversation Minute				
	Switching	HR Transport - Termination	HR Transport - Facility	Local Usage Measurement	Total - Local Switching
Chippewa County Telephone	\$ 0.012408	\$ -	\$ -	\$ -	\$ 0.012408
Hiawatha Telephone	\$ 0.014864	\$ 0.005400	\$ 0.007179	\$ 0.002600	\$ 0.030043
Upper Peninsula Telephone	\$ 0.015723	\$ 0.000806	\$ 0.000305	\$ 0.003645	\$ 0.020478
Winn Telephone	\$ 0.015787	\$ -	\$ -	\$ 0.002501	\$ 0.018288
Twelve Other Petitioners (MECA 2nd TSLRIC Study)	\$ 0.018105	\$ 0.000112	\$ 0.000143	\$ 0.001345	\$ 0.019705

Q. What portions of end office switching are treated as usage-sensitive in the Petitioners' cost studies?

A. The MECA 2nd TSLRIC Study treats all host and remote switch investment as usage-sensitive, except the investment in line ports. The switch "base cost" (typically the switch processor, memory and other "getting started costs"), software, power and other common costs are attributed entirely to usage. I have not analyzed the assignment of end office switching costs in the other four studies; however, given that the switching costs per minute in Table 2 are each significant, it is reasonable to assume that a large portion of end office switching costs are being treated as usage-sensitive.

Q. When were the Petitioners' assumptions made with regard to usage-sensitive end office switching?

²¹ There also are costs for the usage-sensitive interoffice trunk equipment of the switch in the Local Transport – Termination rate element in Table 1.

1 A. Based on the dates of the studies, the assumptions would have been made in the
2 1999-2000 timeframe.

3

4 **Q. Has the MPSC made a determination of the usage-sensitive portion of end**
5 **office switching costs, since 1999-2000?**

6 A. Yes, as I described earlier, in its September, 2004 case reviewing SBC
7 Michigan's costs of telecommunications services, the MPSC found that there are
8 no usage-sensitive costs of end office switching. Following is the Commission
9 finding in that case:

10

11 The Commission finds that SBC should use a flat rate to charge for
12 its switching costs. In the Commission's view, SBC has failed to
13 demonstrate that on a forward-looking basis, switch costs will vary
14 by projected usage. ...

15

16 The Commission finds that there are no usage sensitive costs
17 associated with end-office switching and that the switched access
18 local switching costs per MOU should be set at zero. Likewise, the
19 Commission finds that for local calls subject to reciprocal
20 compensation charges placed to UNE-P customers, the end-office
21 switching costs should be set at zero.²²

22

23 **Q. Has the FCC taken a position on usage-sensitive switching in the context of**
24 **forward-looking economic costs or a TELRIC study?**

25 A. The most recent FCC decision is the 2003 *Virginia Arbitration Cost Order*. The
26 FCC ruled that none of the "getting started" costs of today's modern switches are
27 usage sensitive:²³

²² *Id.*

²³ "The 'getting started' cost of the switch, also known as the 'first cost,' represents the costs of the central processor, memory, maintenance, administrative, test, and spare equipment, and other

1 We conclude . . . that the "getting started" cost of the switch is a
2 fixed cost, meaning that it does not vary with the number of ports
3 or the level of usage on the switch. We find here that the "getting
4 started" costs of the switch should be recovered on a per line port
5 basis. "Getting started" costs are incurred for capacity that is
6 shared among subscribers. Verizon incurs these costs to be ready
7 to provide service upon demand. Given the record evidence that
8 modern switches typically have large amounts of excess central
9 processor and memory capacity, the usage by any one subscriber
10 or group of subscribers is not expected to press so hard on
11 processor or memory capacity at any one time as to cause call
12 blockage, or a need for additional capacity to avoid such blockage.
13 Thus, no one subscriber or group of subscribers is any more or any
14 less causally responsible for the processor or memory capacity
15 costs. Principles of cost causation, therefore, support a per line
16 port cost recovery approach because, more than any other
17 approach, it spreads getting started costs to carriers in a manner
18 that treats equally all subscribers served by a switch.²⁴

19 The FCC similarly ruled that software right-to-use (RTU) costs do not vary by
20 usage and should not be recovered on a per-minute basis.²⁵

21
22 **Q. How have State commissions addressed this subject in recent years?**

23 A. In 2003, the Minnesota Public Utilities Commission set an incumbent LEC's rate
24 for termination at zero because it had determined in an earlier UNE docket that
25 modern switches have no usage-sensitive component that impacts the cost of the
26 switch:

common equipment. Similarly, "getting started" investment refers to investment for such equipment, and 'getting started' equipment refers to this equipment." *Virginia Arbitration Cost Order*, 18 FCC Rcd 17722, 17871 n.988 (2003).

²⁴ *Virginia Arbitration Cost Order*, 18 FCC Rcd at 17903-04 ¶463. See also *id.* at 17877-78 ¶ 391 ("We agree with AT&T/WorldCom that . . . the 'getting started' costs are fixed costs. That is, they are costs that do not vary with the number of lines, trunks, or usage on the switch. Verizon agreed with AT&T/ WorldCom that switch manufactures today design switches that are limited only in the number of lines that they can serve."); *id.* at 17904 ¶ 465 ("Principles of cost causation do not, therefore, support a per MOU price. . .").

²⁵ See *id.* at 17907 ¶¶ 472. See also *id.* at 17906 ¶ 471 (EPHC costs also do not vary by usage).

1 Reciprocal compensation rates must be set “on the basis of a
2 reasonable approximation of the additional costs of terminating
3 such calls.” * * * The Commission sees no justification for
4 retaining reciprocal compensation rates that reflect clearly outdated
5 cost estimates. ... The Commission will therefore adjust the end-
6 office switching component of reciprocal compensation rates based
7 on the new unbundled network element rate for that function. ...
8 This results in a new zero rate for one element of reciprocal
9 compensation, due to the adoption of flat-rate pricing for the local
10 switching element. ... Flat-rate pricing, and the resulting zero rate
11 for end-office switching, are just and reasonable. ...²⁶

12 The Eighth Circuit Court of Appeals recently affirmed the Minnesota
13 Commission’s order, noting that “if no additional costs are incurred, there is
14 nothing to pay”:

15 Under federal law, the MPUC was to base the RCR [reciprocal
16 compensation rate] on “a reasonable approximation of the
17 additional costs” of termination. . . . The MPUC thus had reason
18 to believe in the RCR proceeding that the costs of modern end-
19 office switching did not vary significantly with usage. Multiple
20 parties in the earlier [UNE] proceeding had introduced evidence
21 consistent with that supposition. On this record the MPUC
22 reasonably concluded that the additional costs of terminating a
23 telephone call were approximately zero.²⁷

24
25 It should be noted that other State commissions have made similar determinations
26 regarding end office switching costs.

²⁶ *Investigation into Reciprocal Compensation Rates*, Docket No. P-421/CI-03-384, 2003 Minn. PUC LEXIS 99 (Sept. 24, 2003). *See also id.*, 2003 Minn. PUC LEXIS 144 (Dec. 24, 2003) (MPUC denies CLEC reconsideration petition).

²⁷ *Ace Telephone v. Koppendray*, 432 F.3d 876, 880-81 (8th Cir. 2005). The Eighth Circuit reversed the decision of the district court that had held the MPUC had erred. *See Ace Telephone v. Koppendray*, No. 04-154, 2004 U.S. Dist. LEXIS 24632 (D. Minn., Dec. 6, 2004).

1 **Q. The decisions you have discussed so far involved large incumbent LECs. Are**
2 **there State commission decisions involving rural ILECs and the portion of**
3 **usage-sensitive costs for the switches they would use?**

4 A. Yes. In a recent arbitration between seven rural LECs and Verizon Wireless in
5 Illinois, the LECs argued that 70 percent of their switching costs are usage-sensitive
6 and as a result should be included in transport and termination costs. Earlier this
7 year, the Illinois Commerce Commission rejected this argument and held that none
8 of the costs of rural LEC switches are traffic sensitive:

9 The Commission is of the opinion that the record is lacking clear
10 evidence that the switch costs at issue here are usage sensitive,
11 sufficient to have us alter our view expressed in the SBC [UNE]
12 case that, in general, switching costs are not traffic sensitive. . . .
13 That being the case, we see insufficient reason to depart from our
14 reasoning in the SBC UNE case, 00-0700, and the analysis of the
15 8th Circuit Court of Appeals [in *Ace Telephone*]. Accordingly, we
16 determine that this input should be set at 0%.²⁸

17 The Missouri Public Service Commission reached the same result three months
18 ago, in a case involving Cingular Wireless and T-Mobile USA, in rejecting the
19 rural LEC proposal to treat 70 percent of switching costs as usage-sensitive:

20
21 **Issue No. 4 – What is the appropriate value for the usage-**
22 **sensitive portion of Petitioners forward-looking end office**
23 **switching cost?**

24 **Petitioners** – The HAI [5.0a] Model’s input value assigns 70%
25 of switch costs to usage sensitive costs. This is consistent with the
26 FCC’s Tenth Report and Order in CC Docket 96-45 and the FCC’s
27 “MAG Order.”

28 **T-Mobile/Cingular** – Usage-sensitive costs for switches have
29 fallen dramatically. The current version of HAI [5.3] uses a 0%
30 end office, non-port fraction. No additional costs are appropriate

²⁸ *Hamilton County Telephone Co-op/Verizon Wireless Arbitration Order*, Docket 05-644 *et. al*, at 38, 2006 Ill. PUC LEXIS 5 *94-95 (Jan. 25, 2006).

1 except interoffice trunk equipment. No more than \$18.33 per line
2 should be used as a flat, monthly rate.

3 **Commission Decision:** Consistent with the Arbitrator's Final
4 Decision, the Commission adopts T-Mobile/Cingular's position.
5 The "MAG Order" allows, but does not require, an input value of
6 70%, but also does not preclude a 0% input value. The
7 Commission agrees that switching costs are no longer traffic
8 sensitive.²⁹

9
10 **Q. Have the Petitioners met their burden of proof by showing the basis for their**
11 **assumptions of usage-sensitive end office switching costs?**

12 A. No, they have not. Their assumptions were made in the 1999-2000 timeframe.
13 In spite of the fact that Petitioners' TSLRIC might have been approved by the
14 Commission, there is no support for the assumption that current end office
15 switching costs are usage-sensitive.

16
17 **Q. What is your position on the usage-sensitive portion of end office switching?**

18 A. I agree with the findings of the FCC and State commissions that I have cited.
19 Based on my research on this issue, switch processors, switch matrices and
20 memory of modern digital electronic switches are sized with sufficient capacity
21 such that the busy hour call attempts and busy hour minutes of use (or CCS –
22 hundred call seconds) per line in normal, and even high-use situations, do not
23 cause exhaust. Rather, the quantity of lines terminating on the switch determines
24 the exhaustion of switch capacity, and therefore, is the causer of end office switch
25 costs. The exception to this is the switch trunk equipment that provides the

²⁹ *BPS Telephone Company/Cingular Wireless/T-Mobile Arbitration Order*, Case No. TO-2006-1047, at 7, 2006 Mo. PSC LEXIS 342 (March 23, 2006).

1 interface to interoffice trunks for outgoing and incoming traffic to other switches.
2 The volume of peak traffic (trunk busy hour CCS) over interoffice trunks affects
3 the number of trunk ports required on the switch and the investment in interoffice
4 trunk equipment. I regard these switch components and their costs to be usage-
5 sensitive. However, based on my analysis of switches of varying sizes, the usage-
6 sensitive trunk equipment costs typically are 10 percent or less of total end office
7 switching costs.
8

9 **Q. What is the effect on the proposed rates of removing end office switching**
10 **costs, except for the costs of usage-sensitive interoffice trunk equipment?**

11 A. The costs appearing in the “Switching” column of Table 2 would be eliminated,
12 because they are associated with switch components, which are not usage-
13 sensitive in current digital electronic switches. As mentioned before, in the
14 MECA 2nd TSLRIC Study, these components include the base cost, software costs
15 and other common costs. The costs of interoffice trunk equipment which are not
16 included under local switching, but rather “Local Transport – Termination” in
17 Table 1, would remain. The result of this change is shown below in Tables 3 and
18 4, which are modified versions of Tables 1 and 2, respectively.
19
20
21
22
23

Table 3 - Petitioners' Transport and Termination Rates With Usage-Sensitive IO Trunk Equipment

Petitioners	TSLRIC + Common Costs / Conversation Minute					Switching % of Total
	Local	Local	Local	Total		
	Switching	Transport - Termination	Transport - Facilities			
Chippewa County Telephone	\$ -	\$ 0.006112	\$ 0.034915	\$ 0.041027	0%	
Hiawatha Telephone	\$ 0.015179	\$ 0.003694	\$ 0.001813	\$ 0.020686	73%	
Upper Peninsula Telephone	\$ 0.004755	\$ 0.011532	\$ 0.007017	\$ 0.023305	20%	
Winn Telephone	\$ 0.002501	\$ 0.001265	\$ 0.001784	\$ 0.005550	45%	
Twelve Other Petitioners (MECA 2nd TSLRIC Study)	\$ 0.001599	\$ 0.001472	\$ 0.001288	\$ 0.004359	37%	

Table 4 - Local Switching - Only Usage-Sensitive Interoffice Trunk Equipment

	TSLRIC + Common Costs / Conversation Minute					
Petitioners	Switching	HR Transport -		HR Transport -	Local Usage	Total
		Termination	Facility	Measurement		
Chippewa County Telephone	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Hiawatha Telephone	\$ -	\$ 0.005400	\$ 0.007179	\$ 0.002600	\$ 0.015179	\$ 0.015179
Upper Peninsula Telephone	\$ -	\$ 0.000806	\$ 0.000305	\$ 0.003645	\$ 0.004755	\$ 0.004755
Winn Telephone	\$ -	\$ -	\$ -	\$ 0.002501	\$ 0.002501	\$ 0.002501
Twelve Other Petitioners (MECA 2nd TSLRIC Study)	\$ -	\$ 0.000112	\$ 0.000143	\$ 0.001345	\$ 0.001599	\$ 0.001599

Q. What are the resulting transport and termination costs and rates?

A. For the twelve Petitioners relying on the MECA TSLRIC Study, their rate would be \$0.004359 or 4/10th cent, before any other required corrections to the study. I will describe later some of these additional corrections. Similarly, Winn's transport and termination rate would be approximately 6/10th cent. The remaining three Petitioners rates still are likely overstated due to high transport costs.

Q. Do the local switching costs appear to be reasonable, after removing the non-usage sensitive end office switching costs?

A. There are still two areas of concern. Hiawatha's host-remote (HR) transport costs are over 1.2 cents per minute (\$0.005400 + \$0.007179 from Table 4). The Company has failed to demonstrate that this level of cost reflects "efficient

1 network configuration” per FCC Rule 51.505(b)(1). Secondly, the local usage
2 measurement costs require substantiation.

3
4 **Other Issues in MECA 2nd TSLRIC Study**

5 **Q. Have you identified other defects in the MECA 2nd TSLRIC Study that**
6 **demonstrate it fails to comply with FCC rules?**

7 A. Yes, in reviewing the calculation of switch costs, I noted several issues. A few of
8 the most significant include the following:

- 9 • Current cost to place a digital switching system is overstated. The study is
10 based on the costs to purchase and install switches in the 1999 timeframe, and
11 no adjustment appears to have been made to reflect declines in new switch
12 costs over the past seven years.
- 13 • Power plant costs are inappropriately assigned. No power plant investment is
14 attributed to lines.
- 15 • Local Number Portability (LNP) software costs are inappropriately attributed
16 to transport and termination (of mobile-to-land traffic).
- 17 • Method for computing switched minutes reflects old assumptions (regarding
18 the effect of Digital Subscriber Line access to the Internet).

19
20 When the MECA 2nd TSLRIC Study is corrected for these and other issues, the
21 transport and termination rate, after adjustment for usage-sensitive switching,
22 should be further reduced below the figure of \$0.004359 per minute in Table 3
23 above.

1

2 **Cost Benchmarks**

3 **Q. What do you mean by a cost benchmark?**

4 A. A cost benchmark is an estimate of transport and termination costs which is
5 developed (1) following FCC Rules 51.505 and 51.511 and (2) using publicly
6 available input data, which are generally representative of the forward-looking
7 costs of the Petitioners. While individual Petitioner costs will be different from
8 cost benchmarks, the benchmarks are useful in evaluating the reasonableness of
9 Petitioner cost estimates.

10

11 **Q. Why are you offering cost benchmarks?**

12 A. I have pointed out defects in the Petitioners' cost studies related to including end
13 office switching costs that are not usage-sensitive and recoverable in termination
14 rates. I also have identified other issues with the MECA 2nd TSLRIC Study. I am
15 offering cost benchmarks as further evidence that Petitioners' proposed rates
16 based on the mapping of their TSLRIC study results exceed forward-looking
17 economic costs.

18

19 **Q. What are the cost benchmarks for transport and termination that you are**
20 **proposing?**

21 A. The following table provides upper and lower benchmarks for each component of
22 transport and termination – end office switching, transport – fiber cable (facilities)
23 and transport – termination equipment.

Table 5 - Transport and Termination Cost Benchmarks

	Cost / Minute	
	Lower	Upper
End office switching	\$ 0.0004	\$ 0.0004
Transport - fiber cable	\$ 0.0004	\$ 0.0044
Transport - termination equipment	\$ 0.0006	\$ 0.0040
Total	\$ 0.0015	\$ 0.0088

The benchmarks are developed in a series of spreadsheets shown in Exhibit WCC-2. I based the costs on FCC switch cost data from the 10th Report and Order in the USF proceedings (adjusted to 2006 dollars), data from the HAI Model, version 5.0a, which is publicly available, other public information sources, and estimates based upon my experience, although the latter are limited. Importantly, the end office switching benchmark treats only interoffice trunk equipment and costs as usage-sensitive.

Q. Please briefly describe the benchmarks and how they compare to the Petitioners' proposed rates?

A. The end office switching cost benchmark represents the cost of the interoffice trunk equipment for end offices. I have compared the cost benchmark to the component of the Petitioners' Local Transport – Termination rate for “trunk-side costs” (based on the MECA 2nd TSLRIC Study), and the values are almost identical. The primary difference between the end office switching benchmark and Petitioners' rates is that it does not include the “getting started costs,” software and other switch costs that the Petitioners include in the Local Switching

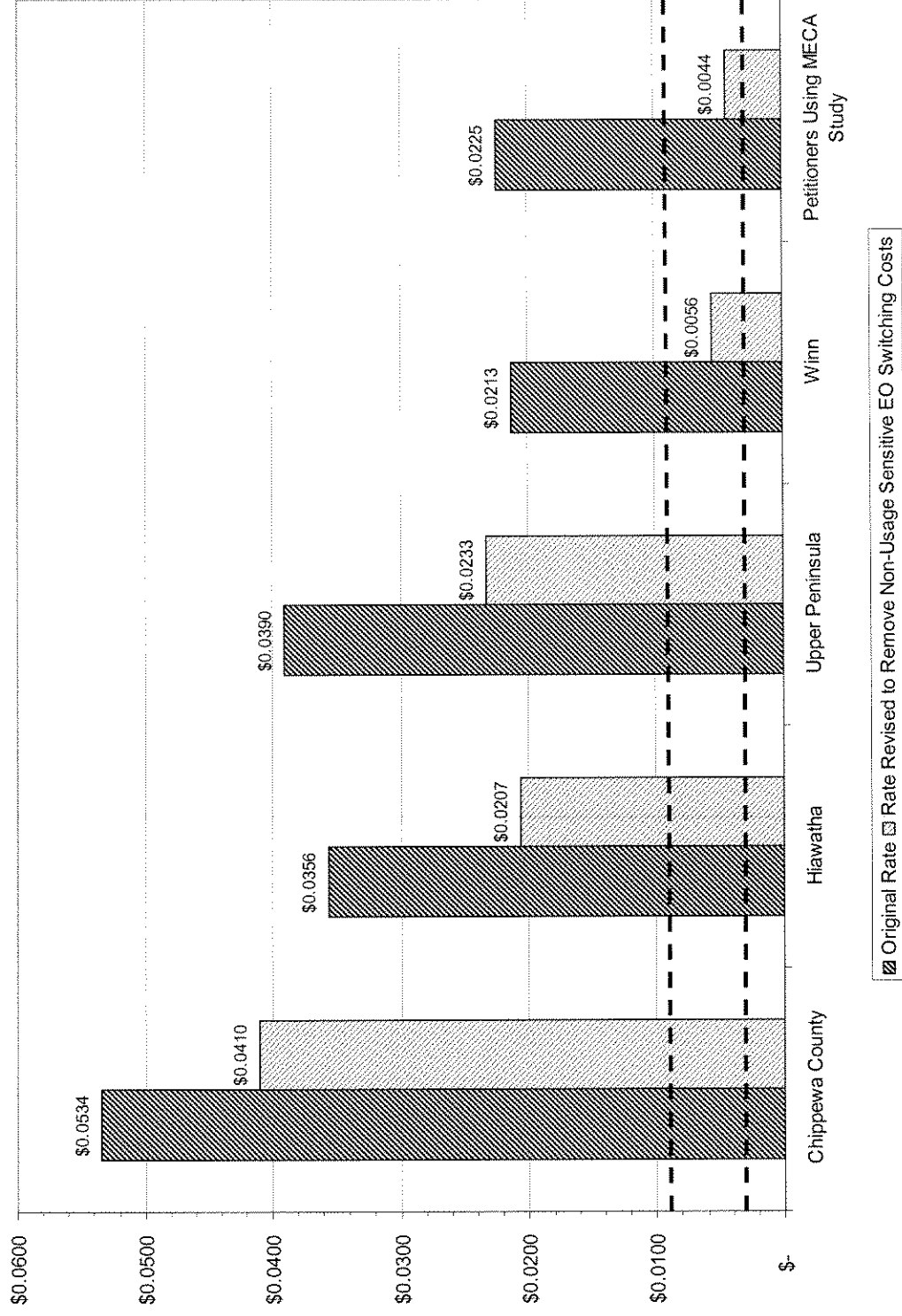
1 rate element. As I have described, these costs are not usage-sensitive and must be
2 excluded from transport and termination rates.

3
4 The transport cost benchmarks reflect a range of costs depending on the
5 utilization level of the interoffice transport system (*i.e.*, the total demand for
6 trunks or DS0 equivalents in service). I have recognized that some Petitioners
7 may have lower utilization and higher costs than others, and vice versa.
8 Comparing the transport cost benchmarks to the Petitioners' rates, I found that the
9 rates for the twelve Petitioners relying on the MECA TSLRIC Study and Winn
10 were not out of the range of reasonableness. The benchmarks, though, clearly
11 show that the transport costs of Chippewa County, Hiawatha and Upper Peninsula
12 are high.

13
14 **Q. Can you provide an illustration comparing the Petitioners' proposed rates to**
15 **the cost benchmarks?**

16 A. Yes, the graph below compares the Petitioner's original proposed rates with the
17 rates after removing end office switching costs that are not usage-sensitive. The
18 graph then plots horizontal lines for the lower and upper values of the transport
19 and termination cost benchmarks.

Transport & Termination Rates
Range of Cost Benchmarks: \$0.0015 - \$0.0088 / MOU



Q. Please summarize the conclusions that should be reached from the information portrayed in the graph?

A. First, the rates for 13 of 16 Petitioners (all but Chippewa County, Hiawatha and Upper Peninsula) would be in the range of reasonableness, if adjusted to include only interoffice trunk equipment costs (or “trunk-side” costs). This is consistent with this Commission’s findings and those of the FCC and other State commissions, including recent arbitrations involving rural ILECs in Illinois and Missouri. Thus, if the Commission chooses not to continue the bill-and-keep arrangement between these companies and Alltel, I have recommended that Alltel’s proposed rate of \$0.006038 per minute be used until cost studies compliant with FCC rules have been produced, reviewed and approved.

Second, even after adjusting their switching rates, the rates of Chippewa County, Hiawatha and Upper Peninsula are too high relative to the upper end of the benchmarks to be valid. Only low interoffice transport system utilization, low trunk utilization, a lack of interoffice cable sharing or similar issue could be causing such high costs. In this case, the costs would not reflect the “efficient network configuration” requirements of FCC Rule 51.505. For this reason, I have recommended that \$0.009 per minute, or approximately the upper cost benchmark, be used as an interim rate, if bill-and-keep is not continued.

CONCLUSION

1 **Q. Please summarize the main points you believe the arbitration panel and**
2 **Commission should draw from your testimony?**

3 A. Briefly, they are the following:

- 4 • The Petitioners have failed to meet their burden of proof per FCC Rule
5 51.505(e). It is not sufficient to develop proposed rates based on a “mapping”
6 of TSLRIC study results, last reviewed and approved by the Commission six
7 to seven years ago, given changes in technology and costs in the succeeding
8 years.
- 9 • The Petitioners’ proposed transport and termination rates exceed today’s
10 forward-looking economic costs based on (1) their inclusion of end office
11 switching costs that are not usage-sensitive and other issues and (2)
12 comparison with cost benchmarks.
- 13 • Any decision on final rates should be postponed until the investigation, review
14 and approval of new TSLRIC studies is completed in U-14781.
- 15 • In the interim or in lieu of final rates, a bill-and-keep arrangement should
16 continue to be used for the exchange of traffic between the Petitioners and
17 Alltel, or the interim rates I have recommended should be used.

18
19 **Q. Does this conclude your direct testimony?**

20 A. Yes.

Exhibit WCC-1

**W. Craig Conwell
405 Hammett Road
Greer, SC 29650**

(864) 268-5306
conwells@bellsouth.net

Independent Consultant

1996 - 2006

Mr. Conwell provides professional services related to telecommunications cost analysis. These services include the following:

- Supporting wireless carriers in negotiations and arbitrations of reciprocal compensation rates with incumbent local exchange carriers (ILEC). This involves reviewing ILEC cost studies for compliance with FCC rules for reciprocal compensation and giving expert testimony before state regulatory commissions.
- Performing cost studies and financial analyses used by ILECs in the valuation of their telephone plant for tax purposes.
- Performing cost studies for telecommunications services, such as Digital Subscriber Line (DSL), hosted Voice over Internet Protocol (VoIP), Frame and Asynchronous Transfer Mode (ATM) services and others. The studies are used in product planning, pricing and cost management.
- Providing analytical support and advice to wireless carriers on the establishment of state Universal Service Funding mechanisms.
- Providing advice and assistance to telephone companies on the development of cost models for estimating plant investments, capital costs and operating expenses.

In addition, Mr. Conwell has taught courses in telecommunications cost analysis.

Arthur Andersen & Co.

1989 - 1996

Mr. Conwell served as a firm-wide expert on telecommunications cost accounting and provided advice to consulting teams working for telephone companies in the US and overseas on cost-related projects. These projects included the following:

- Reviewing Bellcore's Switching Cost Information System (SCIS) for the FCC in its Open Network Architecture proceeding. SCIS was used by the regional Bell Operating Companies (RBOCs) to develop switching element costs.

- Performing a benchmark comparison of US - Canadian toll costs and testifying before the Canadian Radio and Telecommunications Commission (CRTC) on differences between US and Canadian toll costs.
- Developing a “value driver” approach for identifying key performance measures using activity-based costing. The approach was used in consulting projects with telephone companies to improve performance measurement.
- Advising on the design of telephone company cost accounting systems used to measure service costs.
- Developing and teaching for six years a service cost course sponsored by the United States Telephone Association. The course was attended by students from telephone companies, regulatory bodies and other companies in the telephone industry.

Volt Delta Resources

1988 - 1989

Mr. Conwell worked for the President of Volt Delta Resources and assisted in planning and business development for database services offered to telephone companies. He also participated in the development of a new cost accounting system for a Bell Operating Company.

South Central Bell / AT&T

1974 - 1987

Mr. Conwell began work with South Central Bell in 1974 in Engineering where he produced cost studies for pricing telephone services. In 1979, he was promoted to district manager and transferred to AT&T where he participated in operations reviews of service costing and ratemaking procedures across the Bell Operating Companies.

In 1981, Mr. Conwell was promoted to division manager as member of the AT&T planning and financial management staff that analyzed business plans for AT&T's Office of the Chairman. Subsequently, he served as a division controller in AT&T Information Systems and division manager in AT&T General Business Systems responsible for marketing and sales channel support.

Education

Bachelor of Industrial Engineering from Auburn University (1972). Masters of Science in Industrial Engineering (Operations Research) from Auburn University (1974).

Exhibit WCC-2 – Cost Benchmarks

Figure 1

Transport and Termination Forward-Looking Economic Cost Benchmark

End Office Switching	Standalone / Host				Remote				Source
	700 Lines	1,500 Lines	3,000 Lines	700 Lines	1,000 Lines	1,500 Lines			
Switching									
Fixed investment (1999 dollars)	\$ 486,700	\$ 486,700	\$ 486,700	\$ 161,800	\$ 161,800	\$ 161,800	FCC 10th Report and Order, USF Proceedings, ¶236.		
Lines in service	700	1,500	3,000	700	1,000	1,500			
Switch line administrative fill	94%	94%	94%	94%	94%	94%	FCC 10th Report and Order		
Lines of capacity	745	1,596	3,191	745	1,084	1,596			
Per line investment (1999 dollars)	\$ 87	\$ 87	\$ 87	\$ 87	\$ 87	\$ 87	FCC 10th Report and Order		
Total switch investment (1999 dollars)	\$ 561,487	\$ 625,530	\$ 764,360	\$ 226,587	\$ 254,353	\$ 300,630			
Switch cost decrease	12%	12%	12%	12%	12%	12%			
Total switch investment (2006 dollars)	\$ 485,309	\$ 650,466	\$ 672,636	\$ 199,397	\$ 223,631	\$ 264,554	CA Turner Price Index per "Supplemental Consolidated Direct and Rebuttal Testimony," Tahraige O. Cox, III, Tennessee Regulatory Authority, Docket 03-00585, 07/27/04.		
Land & buildings									
Building square feet	200	200	200	100	100	100	4 bays / standalone host & 2 bays / remote X 50 sq. ft. / bay for cageless collocation		
Building investment / sq. ft.	\$ 75	\$ 85	\$ 85	\$ 75	\$ 75	\$ 75	100 space. Per Missouri PSC Arbitration Order in Case No. TO-2006-0147 (03/23/06).		
Building investment	\$ 15,000	\$ 17,000	\$ 17,000	\$ 7,500	\$ 7,500	\$ 8,500	85 "HAI Model Release 5.0a Inputs Portfolio," Sec. 4.2.5.		
Land investment / sq. ft.	\$ 5.00	\$ 7.50	\$ 7.50	\$ 5.00	\$ 5.00	\$ 7.50	"HAI Model Release 5.0a Inputs Portfolio," Sec. 4.2.6.		
Land investment	\$ 2,000	\$ 3,000	\$ 3,000	\$ 1,000	\$ 1,000	\$ 1,500	Land sq. ft. = 2 X building sq. ft. "HAI Model Release 5.0a Inputs Portfolio," Section 4.2.1.		
Capital cost factors									
End office switching	16.5%	16.5%	16.5%	16.5%	16.5%	16.5%	16.5% 10 year economic life, 10% weighted average cost of capital.		
Buildings	12.4%	12.4%	12.4%	12.4%	12.4%	12.4%	12.4% 46.9 year economic life. HAI 5.0a Inputs Portfolio, Sec. 5.2.		
Land	15.4%	15.4%	15.4%	15.4%	15.4%	15.4%			
Network expense factors									
End office switching	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%			
Buildings	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%			
Land	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Capital costs & network expenses									
End office switching	\$ 109,194	\$ 123,855	\$ 151,343	\$ 44,864	\$ 50,362	\$ 59,525			
Buildings	\$ 4,110	\$ 4,658	\$ 4,658	\$ 2,055	\$ 2,055	\$ 2,329			
Land	\$ 308	\$ 462	\$ 462	\$ 154	\$ 154	\$ 231			
Total	\$ 113,612	\$ 128,975	\$ 156,463	\$ 47,073	\$ 52,571	\$ 62,085			
Support expense factor	12%	12%	12%	12%	12%	12%			
Total annual costs before common costs	\$ 127,246	\$ 144,452	\$ 175,239	\$ 52,722	\$ 58,879	\$ 69,535			
Common cost factor	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	"HAI Model Release 5.0a Inputs Portfolio," Sec. 5.5.2.		
Total annual costs, including common	\$ 140,480	\$ 159,475	\$ 193,464	\$ 58,205	\$ 65,003	\$ 76,766			
Usage-sensitive portion of switching costs	3%	5%	8%	6%	8%	10%	Calculated as the percentage of switch interoffice trunk investment / total switch investment		
Usage-sensitive annual costs	\$ 3,715	\$ 7,967	\$ 15,819	\$ 3,746	\$ 5,324	\$ 7,980			
Usage-sensitive annual costs / line	\$ 5.31	\$ 5.31	\$ 5.27	\$ 5.35	\$ 5.32	\$ 5.32			

Transport and Termination Forward-Looking Economic Cost Benchmark

Figure 1

End Office Switching

	Standalone / Host			Remote			Source
	700 Lines	1,500 Lines	3,000 Lines	700 Lines	1,000 Lines	1,500 Lines	
Annual switched minutes of use / line	12,000	12,000	12,000	12,000	12,000	12,000	"A Survey of Unbundled Network Element Prices in the United States," PSC of WV, 03/06, footnote 14.
End office switching cost / minute of use	\$ 0.0004	\$ 0.0004	\$ 0.0004	\$ 0.0004	\$ 0.0004	\$ 0.0004	
Interoffice trunk investment / line	\$ 18.33	\$ 18.33	\$ 18.33	\$ 18.33	\$ 18.33	\$ 18.33	HAI 5.0a \$18.33 = \$100 investment / trunk X 1.1 installation factor / 6 lines / trunk. Inputs Portfolio, Secs. 4.5.4, 4.1.8.
Total end office switching investment / line	\$ 693.30	\$ 366.98	\$ 224.21	\$ 284.85	\$ 223.83	\$ 176.37	
Usage-sensitive % of end office switching	3%	5%	8%	6%	8%	10%	

Notes:

1. The minimum line size for use with the FCC switch cost data is 700 lines. Analysis of actual rural ILEC switch investments from the Rural Utility Service indicate that the FCC switch cost data overstate investments for switches with fewer than 700 lines.

Transport and Termination Forward-Looking Economic Cost Benchmark

Figure 2

Transport - Fiber Cable									
Interoffice link, route mileage:	12 Fiber Cable			24 Fiber Cable			Source		
	5 miles	20 miles	40 miles	5 miles	20 miles	40 miles	20 miles	40 miles	211,200
Interoffice link distance (route-feet)	26,400	105,600	211,200	26,400	105,600	211,200			
Buried cable cost / foot installed	\$ 2.90	\$ 2.90	\$ 2.90	\$ 3.50	\$ 3.50	\$ 3.50	\$ 3.50	\$ 3.50	3.50 "HAI Model Release 5.0a Inputs Portfolio," Sec. 4.4.13.
Interoffice buried cable investment	\$ 76,560	\$ 306,240	\$ 612,480	\$ 92,400	\$ 369,600	\$ 739,200			
Capital cost factor	13%	13%	13%	13%	13%	13%	13%	13%	13% 25.9 year economic life per HAI 5.0a Inputs Portfolio, Sec. 5.2.
Network expense factor	3%	3%	3%	3%	3%	3%	3%	3%	3%
Capital costs & network expenses	\$ 12,326	\$ 49,305	\$ 98,609	\$ 14,876	\$ 59,506	\$ 119,011			
Support expense factor	12%	12%	12%	12%	12%	12%	12%	12%	12%
Total annual costs before common costs	\$ 13,805	\$ 55,221	\$ 110,442	\$ 16,662	\$ 66,646	\$ 133,293			
Common cost factor	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4% "HAI Model Release 5.0a Inputs Portfolio," Sec. 5.5.2.
Total annual costs, including common	\$ 15,241	\$ 60,964	\$ 121,928	\$ 18,394	\$ 73,577	\$ 147,155			
Total demand - fibers	4	4	4	4	4	4	4	4	4 "HAI Model Release 5.0a Inputs Portfolio," Sec. 4.4.14.
Interoffice transport system									Based on 50%/50% sharing of interoffice cable costs. Missouri PSC Order Arbitration
Other uses (loop concentrators, leased fibers, etc.)	4	4	4	4	4	4	4	4	4 Order in Case No. TO-2006-0147 (03/23/08).
Total	8	8	8	8	8	8	8	8	
Annual costs / fiber in service	\$ 1,905	\$ 7,621	\$ 15,241	\$ 2,299	\$ 9,197	\$ 18,394			
Annual costs attributable to IO transport system	\$ 7,621	\$ 30,482	\$ 60,964	\$ 9,197	\$ 36,789	\$ 73,577			
Total demand on IO transport system link									
Nominal capacity - OC3 transport system - DS0 equivalents	2,016	2,016	2,016	2,016	2,016	2,016	2,016	2,016	3 DS3 / OC3 X 28 DS1 / DS3 X 24 DS0 / DS1
Alternative utilization levels - DS0 equivalents									
3 DS1 - 4% utilization	72	72	72	72	72	72	72	72	
1 DS3 - 33% utilization	672	672	672	672	672	672	672	672	
2 DS3 - 66% utilization	1,344	1,344	1,344	1,344	1,344	1,344	1,344	1,344	
Annual costs / DS0 equivalent									
4% utilization	\$ 105.84	\$ 423.36	\$ 846.73	\$ 127.74	\$ 510.95	\$ 1,021.91			
33% utilization	\$ 11.34	\$ 45.36	\$ 90.72	\$ 13.69	\$ 54.75	\$ 109.49			
66% utilization	\$ 5.67	\$ 22.68	\$ 45.36	\$ 6.84	\$ 27.37	\$ 54.75			
Annual minutes of use / trunk	120,533	120,533	120,533	120,533	120,533	120,533	120,533	120,533	HAI 5.0a default value based on 30% average utilization of the maximum capacity of a trunk. Maximum capacity is 75% of nominal capacity (36 BH CCS).
Transport - fiber cable cost / MCU-link									
4% utilization	\$ 0.00088	\$ 0.00351	\$ 0.00702	\$ 0.00106	\$ 0.00424	\$ 0.00848			
33% utilization	\$ 0.00009	\$ 0.00038	\$ 0.00075	\$ 0.00011	\$ 0.00045	\$ 0.00091			
66% utilization	\$ 0.00005	\$ 0.00019	\$ 0.00038	\$ 0.00006	\$ 0.00023	\$ 0.00045			

Transport and Termination Forward-Looking Economic Cost Benchmark

Figure 2

Transport - Fiber Cable							
Interoffice link route mileage:							
		12 Fiber Cable		24 Fiber Cable		Source	
		5 miles	20 miles	40 miles	5 miles	20 miles	40 miles
Transport - fiber cable cost / MOU							
Scenario 1							
Link 1 - 5 miles from host to meet point - 33% utilization	\$	0.00009			\$	0.00011	
Link 2 - 20 miles from host to remote - 4% utilization	\$		0.00351	\$		0.00424	
Total - Scenario 1				\$	0.00361		\$ 0.00435
Scenario 2							
Link 1 - 5 miles from host to meet point - 66% utilization	\$	0.00005			\$	0.00006	
Link 2 - 20 miles from host to remote - 33% utilization	\$		0.00038	\$		0.00045	
Total - Scenario 2				\$	0.00042		\$ 0.00051

Prepared: 06-09-06

Transport and Termination Forward-Looking Economic Cost Benchmark

Figure 3

Transport - Termination Equipment					
DSO equivalents per node:					Source
	3 DS1 - 4% utilization	1 DS3 - 33% utilization	2 DS3 - 66% utilization		
Termination equipment					
OC3 / DS1 terminal multiplier	\$ 20,500	\$ 22,000	\$ 24,000	"HAI Model Release 5.0a Inputs Portfolio," Sec. 4.4.1.	
Optical distribution panel	\$ 1,000	\$ 1,000	\$ 1,000	" , Sec. 4.4.4.	
Pigtails	\$ 1,440	\$ 1,440	\$ 1,440	" , Sec. 4.4.3.	
Engineering & installation - terminal mux	\$ 1,760	\$ 1,760	\$ 1,760	" , Sec. 4.4.5, 4.4.6.	
Digital cross-connect / DS3	\$ 30,000	\$ 30,000	\$ 60,000	" , Sec. 4.4.11.	
Total	\$ 54,700	\$ 56,200	\$ 88,200		
Power plant loading					
	9%	9%	9%		
Total termination equipment investment	\$ 59,623	\$ 61,258	\$ 96,138		
Capital cost factor					
	16.5%	16.5%	16.5%	10 year economic life, 10% cost of capital	
Network expense factor	6.0%	6.0%	6.0%		
Capital costs & network expenses					
	\$ 13,415	\$ 13,783	\$ 21,631		
Support expense factor					
	12%	12%	12%		
Total annual costs before common costs	\$ 15,025	\$ 15,437	\$ 24,227		
Common cost factor					
	10.4%	10.4%	10.4%	"HAI Model Release 5.0a Inputs Portfolio," Sec. 5.5.2.	
Total annual costs, including common	\$ 16,588	\$ 17,042	\$ 26,746		
Total demand - DSO equivalents					
	72	672	1,344		
Annual costs / DSO equivalent	\$ 230.38	\$ 25.36	\$ 19.90		
Annual minutes of use / trunk					
	120,533	120,533	120,533	HAI 5.0a default value based on 30% average utilization of the maximum capacity of a trunk. Maximum capacity is 75% of nominal capacity (36 BH CCS)	
Transport - termination equipment cost / MOU-termination	\$ 0.0019	\$ 0.0002	\$ 0.0002		
Transport - termination equipment cost / MOU Scenario 1					
Host - two terminations - 33% utilization on meet point link & 4% utilization on HR link	\$ 0.0019	\$ 0.0002			
Remote - one termination - 4% utilization	\$ 0.0019				
Total - Scenario 1			\$ 0.0040		
Scenario 2					
Host - two terminations - 66% utilization on meet point link & 33% utilization on HR link		\$ 0.0002	\$ 0.0002		
Remote - one termination - 33% utilization		\$ 0.0002			
Total - Scenario 2			\$ 0.0006		

Prepared: 06-09-06