PUBLIC UTILITIES COMMISSION OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE PETITION OF ALLIANCE COMMUNICATIONS COOPERATIVE, INC., BERESFORD MUNICIPAL TELEPHONE COMPANY, MCCOOK COOPERATIVE TELEPHONE COMPANY, SANTEL COMMUNICATIONS COOPERATIVE, INC., AND WEST RIVER COOPERATIVE TELEPHONE COMPANY FOR ARBITRATION PURSUANT TO THE TELECOMMUNICATIONS ACT OF 1996 TO RESOLVE ISSUES RELATING TO AN INTERCONNECTION AGREEMENT WITH ALLTEL COMMUNICATIONS, LLC.	Docket Nos. TC 07-111 TC 07-112 TC 07-113 TC 07-114 TC 07-115 TC 07-116

REBUTTAL TESTIMONY OF W. CRAIG CONWELL

PUBLIC

July 7, 2008

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INTRODUCTION

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

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

Q. Have your previously filed testimony in this case?

A. Yes, I filed on March 24, 2008 direct testimony on behalf of Alltel Communications, LLC ("Alltel"). I also filed on June 12, 2008 supplemental direct testimony.[1] This testimony provided the results of my review of the forward-looking economic cost studies for transport and termination produced by the six Rural Local Exchange Carriers ("RLECs") in this case.[2] I found the studies do not comply with FCC rules for establishing cost-based reciprocal compensation rates in 47 C.F.R. 51.705(a)(1), 51.505 and 51.511. The proposed rates resulting from these studies substantially exceed the RLECs' forward-looking economic costs. My direct testimony identified 18 cost-related issues with the studies, which the South Dakota Public Utilities Commission (the "Commission") was asked to decide in establishing

[1] "Direct Testimony of W. Craig Conwell on behalf of Alltel Communications, LLC.," March 24, 2008. "Supplemental Direct Testimony of W. Craig Conwell on Behalf of Alltel Communications, LLC.," June 12, 2008. Before the State of South Dakota Public Utilities Commission, Docket Nos. TC07-111 through TC 07-116.

[2] The RLECs are Alliance Communications Cooperative, Inc., Beresford Municipal Telephone Company, Kennebec Telephone Company, McCook Cooperative Telephone Company, Santel Communications Cooperative, Inc. and West River Cooperative Telephone Company.

reciprocal compensation rates in compliance with FCC rules.[3] I indicated that RLEC transport and termination costs are expected to be $0.0059 per minute, or less. My supplemental direct testimony provided additional evidence to support my findings and recommendations on certain of the cost issues.

Q. What is the purpose of your reply testimony?

A. I will respond to the direct testimonies of Tim Eklund and Nathan Weber filed on March 24, 2008 on behalf of the RLECs. They discussed the RLEC's forward-looking economic cost studies and proposed transport and termination rates. Ron Williams of Alltel is responding to the testimonies of Dan Davis and Larry Thompson, the RLEC witnesses for non-cost issues.

RLECS HAVE FAILED TO PROVE COST STUDIES COMPLY WITH FCC RULES

Q. Please briefly describe the testimonies of Messrs. Eklund and Weber.

A. Mr. Eklund cited the various FCC rules for determining forward-looking economic costs as the basis for reciprocal compensation rates. He then gave a general description of the RLEC cost studies and stated at several points in his testimony that the studies comply with the FCC rules. Mr. Weber discussed switching and transport technologies reflected in the cost studies and provided a general description of the switch and transport investments provided as input to the cost studies.

[3] See Conwell Direct Testimony pages 8-10 for a table of RLEC cost study issues and recommendations for the resolution of each issue.

The testimonies of Messrs. Eklund and Weber did not discuss the specifics of key assumptions, methods and input data. For example, the following are three key assumptions made in the RLEC cost studies:

1. The same equipment configurations for all host and non-host switches result in the lowest costs for termination,
2. An OC-192 transport system for all interoffice rings results in the lowest cost for transport.
3. "Paths" are the appropriate measure of transport capacity, rather than DS-1 equivalent circuits.

Key input data include, for example, information on the capacities of switch *common* equipment items necessary to distinguish non-usage sensitive and usage-sensitive investment and costs, and the total demand for transport.[4] The cost study documentation produced by the RLECs and now the testimonies of their cost witnesses have failed to prove that the cost studies and proposed rates meet the requirements of the FCC rules.

Q. Can the Commission simply rely upon Mr. Eklund's assertions that the RLEC cost studies and proposed rates comply with FCC rules?

A. No, it cannot. FCC Rule 51.505(e) requires proof that RLEC cost studies properly determine forward-looking economic costs as defined in §§51.505

[4] Switch *common* equipment items include media gateway chasses, call agents, outboard line bays, various software and other items.

and 51.511 and that transport and termination rates do not exceed these costs. The rule states as follows:

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

Section 51.505(e)(2) further states: "The record of any state proceeding in which a state commission considers a cost study for purposes of establishing rates under this section shall include any such cost study."

Q. Are there specific requirements of the FCC rules that the RLECs must prove they have satisfied?

A. Yes, FCC Rules §§51.505 and 51.511 have specific requirements of cost studies. These include the following:

1. Costs must be forward-looking and not those incurred in the past (embedded costs). (§§51.505(b) and 51.505(d)(1))
2. Costs must be directly attributable to transporting and terminating Alltel mobile-to-land traffic. The costs to provide network elements or services other than transport and termination may not be included. (§51.505(b))
3. Costs must reflect efficient network configuration, which according to the FCC rule means "the use of the most efficient telecommunications technology currently available and the lowest cost network configuration, given the existing location of the incumbent LEC's wire centers." (§51.505(b)(1))

4. Costs must reflect the forward-looking cost of capital, which implies that capital costs reflect the forward-looking mix of debt and equity and the expected costs of debt and equity. (§51.505(b)(2))
5. Forward-looking common costs are to reflect costs that are "efficiently incurred." (§51.505(c))
6. Retail costs may not be included. (§51.505(d)(2))
7. Forward-looking economic costs per unit are to reflect projected total demand during a reasonable measuring period including the RLEC's own use of plant and other carriers' use of plant. (§51.511(a))

These are not loosely defined characteristics of forward-looking economic costs. They have specific meaning, and a cost study either complies with these requirements, or it does not. It is not enough for Mr. Eklund or Mr. Weber to simply state that the RLEC cost studies comply with FCC rules – they must prove it.

Q. Can you give an example of the steps an RLEC would take to prove its cost study is in compliance?

A. Let's use transport electronics as an example. This is one of three components of transport and termination. The other two are switching and transport outside plant. Transport electronics represents the transmission equipment located in RLEC wire centers used to connect circuits carrying voice trunks

and special circuits to fiber rings.[5] To prove that transport electronics investment reflects efficient network configuration, the third requirement above, the following tasks are required:

1. Identify a future period for projecting total demand for transport electronics. Transport electronics plant is placed to serve future demand, and the costs of this plant are recovered from the services causing this demand. Therefore, future demand determines plant capacity requirements and the "base" over which plant costs are recovered. The broader the base, the lower the unit cost. The RLEC cost studies do not identify the future period over which transport electronics demand is projected nor the services that comprise that demand; furthermore, evidence indicates that the voice trunk and special circuit quantities used in the cost studies are past results, not a projection.
2. Project total demand during this period, including the RLEC's own voice trunks and special circuits, and the circuits of other carriers (transit circuits). The method and data used to develop projected demand also would be provided to validate the demand quantity.
3. Express demand using the proper measure of transport electronics capacity consumption (*e.g.*, equivalent DS1 circuits). The RLECs have used "paths" as the measure of transport demand, which is an improper measure. Messrs. Eklund and Weber provided no explanation for this method.

[5] See "Direct Testimony of Nathan Weber on Behalf of West River Cooperative Telephone Inc.," State of South Dakota Public Utilities Commission, Docket No. TC07-116, pp. 10-11.

4. Identify the lowest cost types, sizes and quantities of transport electronics *base*, *line* and *tributary* equipment necessary to serve total demand.[6] The RLECs have assumed OC-192 transport systems for every interoffice ring. Instead of arbitrarily assuming the same interoffice ring type and size, the RLECs should demonstrate that other ring types and sizes are not feasible and lower cost. For example, might an OC-48 or smaller transport system satisfy future demand at lower cost?
5. Demonstrate that plant investments reflect the current costs an RLEC would incur to purchase and install plant.

This example for transport electronics investment deals with proof for only one of the FCC requirements – efficient network configuration – and one of three elements of transport and termination. Proof is required for the other items I described above – exclusion of embedded costs, inclusion of only costs directly attributable to transport and termination, *etc.*, and for switching and transport outside plant investments and costs. At this time, the RLECs have failed to "prove to the state commission that the rates for each element it offers do not exceed the forward-looking economic cost" as required by §51.505(e). The Commission, therefore, cannot accept the RLEC cost studies and proposed rates based on the evidence.

[6] *Base*, *line* and *tributary* equipment refer to the three types of transport electronics equipment. See Nathan Weber's Direct Testimony, pp.10-11.

EVIDENCE CONTRADICTS TESTIMONY THAT RLEC COST STUDIES COMPLY WITH FCC RULES

Q. In your direct and supplemental direct testimonies you identified issues where the RLEC cost studies do not comply with FCC rules, or where there are serious questions about compliance. Is that correct?

A. Yes, I identified 18 cost-related issues with respect to the RLEC cost studies. I have included as Exhibit WCC-R1 a copy of the table from my direct testimony identifying these issues. I provided evidence that indicated that the studies fail to comply with FCC rules, or if insufficient information was available, I raised questions regarding compliance. I recommended that the Commission address each issue and that the RLEC cost studies be re-run to bring them in compliance.

Q. What do you anticipate will be the RLECs response to these issues?

A. Since Messrs. Eklund and Weber did not provide testimony and offer evidence to prove that the RLEC cost studies comply with FCC rules, I anticipate that they will attempt to respond to the 18 cost issues in reply testimony. It will be incumbent on the Commission to carefully scrutinize their reply testimony to validate any new evidence they may offer and to determine whether the RLEC cost studies have been proven to comply with the FCC rules. Based on the available evidence, however, I do not believe these studies can comply with the FCC rules until they have been appropriately modified.

Q. Turning to Mr. Eklund's direct testimony, what are the specific instances in which his statements regarding RLEC cost study compliance with FCC rules are incorrect or questionable?

A. On page seven of his direct testimony Mr. Eklund describes FCC Rule §51.505(b)(1) for efficient network configuration.[7] He states as follows:

> First, it requires that the network configuration be based on the most efficient technology currently available. Second, it requires that the lowest cost network configuration be used given the existing location of the ILEC's wire centers.
>
> The FLEC study filed on behalf of West River is based on current switch technology at its existing wire centers. In developing transport and termination costs for reciprocal compensation purposes, existing wire centers reduce the complexity of network design. The costs associated with interoffice transport were based on current technology used by West River.

Mr. Eklund's statement that the cost studies are based on current technologies for switching and interoffice transport provides no assurance or proof that the specific hardware and software components in each exchange and the quantities of these components actually reflect lowest cost configurations. To simply state that plant reflects current technologies offers no evidence that plant investments reflect the most efficient architecture to serve demand or that plant is efficiently sized and utilized. Plant may reflect current technology and yet be inefficient relative to other lower cost configurations of the same technology. Assuming switches are placed at existing wire centers

[7] "Direct Testimony of Tim Eklund on Behalf of West River Cooperative Telephone Company," Before the Public Utilities Commission of the State of South Dakota, Docket No. TC07-116.

arguably may reduce the complexity of network design, but it does not necessarily mean that switching and transport costs reflect efficient network configuration.

Q. Has Alltel asked whether lower cost configurations of plant might be possible?

A. Yes, in its first set of interrogatories made to Kennebec, Alltel asked the following:

> DR16. You have a host switch serving [redacted] lines with an investment of [redacted] and a remote switch serving [redacted] lines with an investment of [redacted] This results in a switch investment/line of [redacted] Of the total switch investments, [redacted]s for switch processors/matrix.
>
> (a) Are other technologies currently available and technically feasible that would result in lower forward-looking switch investment/line for Kennebec Telephone?
> (b) Are other network configurations of switches (host and remote) and digital loop carrier systems (remote terminals) technically feasible that would result in lower forward-looking costs for Kennebec?

Q. What was Kennebec's response?

A. Kennebec's response was the following:

> (a) The FLEC estimates for the switching network components for Kennebec Telephone Company are based upon Softswitching technology. This technology is believed to be an economical solution that would meet Kennebec's technical requirements and is currently being deployed in similar circumstances.
>
> (b) This solution provides the appropriate grade of service for the subscribers of Kennebec Telephone Company. This network configuration is believed to be an economical solution that would

> meet Kennebec's technical requirements and is currently being deployed in similar circumstances.

The response does not indicate (1) whether other technologies were considered, (2) whether other configurations of equipment were considered, and (3) whether the Kennebec cost study reflects the lowest cost configuration. It merely states that the study represents "an economical solution." The testimonies of Messrs. Eklund and Weber added no new information on this issue.

Q. Is there evidence to suggest or indicate that the RLEC cost studies do not reflect efficient network configuration?

A. Yes. Information produced by the RLECs on May 16, 2008 in supplemental responses to Alltel's first set of interrogatories indicated several instances in which the RLEC cost studies do not reflect the lowest cost configuration of switching and transport plant. I discussed these in my supplemental direct testimony.[8]

- Call Agent and related software. Metaswitch, the manufacturer of the Call Agent, states on its website that its Call Agents have tremendous capacity to handle busy hour call attempts, and Metaswitch offers an "integrated softswitch option" that might lower plant investment. The website describes the option as follows:

> Note that service providers without the need for a distributed architecture or scalability beyond 250,000 busy hour call

[8] See Conwell Supplemental Direct Testimony, pp. 9, 12, 13, 14 and 20.

> attempts (approximately 70,000 subscribers) do not have to deploy a Call Agent server at all. Metaswitch offers the option to run the Call Agent software on an Integrated Softswitch processor blade, integrating Call Agent, Media and Signaling gateway in a single chassis.[9]

- Spares. The cost studies assume media gateway and other spares are required for switches in all exchanges. Since many switches likely are in unmanned locations requiring a technician to be dispatched for physical repairs, switch investment and costs might be lowered by centralizing spares and reducing their quantities.
- Media gateways and related components. Media gateways are assumed in all exchanges, regardless of their size in terms of access lines served. This cost study assumption results in very high switch investments and costs in small exchanges. To prove efficient network configuration, the RLECs should show that media gateways and related components are required for all exchanges and that lower cost technologies or equipment configurations are not possible.
- Trunk cards. The cost studies assume one type of trunk card for all host switches and another type for all non-host switches, regardless of demand. Information produced by the RLECs in supplemental responses to Alltel's interrogatories suggests that all but one host switch might be served by the lower cost trunk card used for non-host switches.
- OC-192 *base* and *line* equipment. The RLECs assume OC-192 transport *base* and *line* equipment for all interoffice rings. They have not shown

[9] See http://www.metaswitch.com/products/callagent.htm.

that the capacity of OC-192 rings is necessary, and that a smaller, lower cost transport system would not be adequate to serve total demand. On the other hand, if the RLECs can justify the capacity, investment and costs of OC-192 systems based on future demand, this would significantly lower transport investments and costs per DS-1 equivalent circuit and per minute.

Mr. Eklund did not explain in his testimony the rationale for assuming the same configurations for host and non-host switches or all OC-192 interoffice rings. He also did not show that such assumptions result in the lowest cost network configurations.

Q. Which of the cost issues in Exhibit WCC-R1 are affected by efficient network configuration?

A. Cost Issues 1.1, 2.1 and 3.1 are affected by efficient network configuration. Switch and transport electronics investments (Cost Issues 1.1 and 2.1) are affected by (1) the type of technologies used, (2) the types of equipment included in the network configuration (*e.g.*, standalone Call Agents versus the integrated softswitch option) and (3) the capacity and quantities of equipment. Transport outside plant investments (Cost Issue 3.1) are affected by interoffice mileages.

Q. What do you recommend the Commission do to obtain proof of efficient network configuration?

A. Earlier I outlined a series of steps for demonstrating that transport electronics investment reflects efficient network configuration. These or similar steps can be used by the Commission to validate switch and transport electronics investments as the lowest cost. For the interoffice mileages underlying the transport outside plant investments, the Commission might ask three simple questions – (1) if RLEC cost study mileages are greater than existing mileages, why?; (2) do the mileages represent the least cost routing among wire centers; and, (3) do any interoffice mileages include cables not utilized by Alltel's mobile-to-land traffic? I asked these questions in my direct testimony.[10]

Q. Please describe the next instance in Mr. Eklund's testimony where it is incorrect or questionable whether the RLEC cost studies comply with FCC rules.

A. On page nine of his testimony, Mr. Eklund listed the four costs that are excluded from forward-looking economic cost studies according to FCC Rule §51.505(e) – embedded costs, retail costs, opportunity costs and revenues to subsidize other services. He then states, "The FLEC study submitted on behalf of West River does not include any of these items and the study fully

[10] See Conwell Direct Testimony, pp. 75-78.

complies with this standard."[11] This statement is incorrect as I described in my supplemental direct testimony.[12]

- Beresford transport electronics embedded investment. Beresford appears to have based its transport electronics investment on its existing equipment and embedded investment in the Beresford central office to connect to the SDN Communications transport backbone. This resulted in the highest transport electronics investment per "path" among the RLECs. Other RLECs with SDN connections appear to have used the same approach.
- Web Self-Care System and related software. *Common* switch investment and costs included in termination include unidentified amounts for Web Self-Care, which is used to provide retail services.
- CALEA and Centrex licenses. In addition, the RLECs indicated *common* switch investment and costs include amounts for CALEA and Centrex licenses, which would not be direct costs of termination. Centrex license costs are attributable to retail services.

Q. Which of the cost issues in Exhibit WCC-R1 are affected by these violations of FCC Rule §51.505(e)?

A. To the extent Beresford and other RLECs have reflected existing, embedded equipment types, quantities or investments in their cost studies for SDN

[11] Mr. Eklund makes similar statements for other RLECs. For example, after identifying the same four costs excluded from forward-looking economic cost studies, he stated for Alliance, "The FLEC study submitted on behalf of Alliance does not include any of these items and the study fully complies with this standard."

[12] See Conwell Direct Testimony, pp. 18, 10.

connections, this affects Cost Issue 2.1. The inclusion of investments for Web Self-Care, CALEA licenses, Centrex licenses and any other switch components not directly attributable to, or used in the provision of, termination affect Cost Issues 1.1 and 1.3. Assuming these are legitimate switching investments, they might be included in switch investments per Cost Issue 1.1, but they should be excluded from the usage-sensitive portion of switch investments per Cost Issue 1.3.

Q. How do you recommend the Commission address these errors in the RLEC cost studies?

A. If the Commission determines that existing, embedded equipment types, quantities or investments are included in the cost studies, it should require Beresford and other RLECs to modify transport electronics investment to be (1) forward-looking, (2) efficiently designed and (3) include only transport electronics plant used in terminating Alltel mobile-to-land traffic. To determine switch *common* investments directly attributable to termination, the Commission should require the RLECs to identify only those hardware and software items in Mr. Weber's Exhibit NW-D-4 necessary to terminate mobile-to-land calls and to remove the costs of those items not attributable to termination.

Q. What is the next statement by Mr. Eklund with which you disagree?

A. Mr. Eklund cites on page nine of his testimony FCC Rule §51.511, which states that forward-looking economic costs per unit are to be based on "a reasonable projection of the sum of the total number of units of the element that the incumbent LEC is likely to provide to requesting telecommunications carriers and the total number of units of the element that the incumbent LEC is likely to use in offering its own services, during a reasonable measuring period." He then states, "The units used to develop transport and termination rates were a projection of the total switch minutes for termination and the total transmission minutes for transport."

Mr. Eklund's statement attempts to assure us that the requirements of §51.511 have been met; however, this is not the case with respect to transport costs. First, the RLECs appear to have measured demand for transport electronics ("paths") in the past, rather than basing demand on "a reasonable projection." This is discussed on page 66 of my direct testimony. Second, the demand quantities for transport electronics do not include transit circuits, which §51.511 specifically requires ("total number of units of the element that the incumbent LEC is likely to provide to requesting telecommunications carriers"). This issue is discussed in my direct testimony on pages 63 to 65. Third, on pages 56-62 of direct testimony, I described how the use of "paths" as the measure of transport demand is incorrect. Equivalent DS-1 circuits are the appropriate measure of transport electronics demand.

Q. Which of the cost issues in Exhibit WCC-R1 are affected by these deviations from FCC Rule §51.511?

A. This set of issues is perhaps the most complicated. Cost Issues 2.2 and 3.3 address the question of whether "paths" or DS-1 equivalent circuits should be used as the measure of transport demand. Cost Issue 2.3 asks whether transit circuits should be included in total demand in the calculation of transport electronics costs per minute. Cost Issue 2.4 asks for the total quantity of DS-1 equivalent circuits, including transit circuits and projected during a future period. Finally, Cost Issues 1.4, 2.6 and 3.4 ask for the appropriate quantity of annual minutes per voice trunk. The issue is what level of minutes per voice trunk represents efficient utilization of the trunks. The RLEC cost studies reflect actual utilization levels of voice trunks, which are well below the level required by the FCC in Rule §51.513(c)(4).[13]

Q. How do you recommend the Commission address this set of issues?

A. First, the Commission must determine for Cost Issues 2.2 and 3.3 whether "paths" is the appropriate measure of transport electronics demand or capacity consumption. It is not, and I discuss why it is not in my supplemental direct testimony based on evidence produced by the RLECs.[14] Next, the Commission must decide whether transit circuits must be included in total demand. FCC Rule §51.511 clearly requires that total demand include

[13] See Conwell Direct Testimony, Exhibit WCC-6.6. This exhibit shows in column I that the RLEC cost study minutes per trunk range from only [redacted] percent of the trunk utilization level required by the FCC in §51.513(c)(4).

transport circuits used by other carriers. Then, the Commission should require each RLEC to identify a future period to project transport demand (equivalent DS-1 circuits) and to develop a valid estimate of total demand including the RLEC's own traffic and the traffic of other carriers.[15] This information should be used to validate the assumption of OC-192 transport systems and to compute unit costs per §51.511. Finally, the Commission should determine whether the standard of 108,000 annual minutes per voice circuit required in §51.513(c)(4) is appropriate for the RLECs.

Q. Please briefly discuss the next issue with Mr. Eklund's testimony.

A. On page 11 of his testimony, Mr. Eklund states that "Transport and termination costs include the costs of traffic sensitive switching and interoffice transport facilities." In my supplemental direct testimony, I identified several components of switch *common* investments and costs that are not traffic-sensitive. *Common* switch investment and costs should be largely excluded from termination, leaving only the usage-sensitive *trunk card* investment and costs recoverable in reciprocal compensation.[16]

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[14] See Conwell Supplemental Direct Testimony, pp. 21-24.

[15] For example, if an RLEC is deploying DSL, video or other broadband services over its network, the projected demand for those services must be included in total demand, resulting in lower transport costs per equivalent DS-1 circuit and per minute of transport.

[16] See Conwell Supplemental Direct Testimony, pp. 9-12, sections related to Call Agent, Media Gateway and Outboard Line Bay.

This is Cost Issue 1.3 in Exhibit Reply WCC-R1. To resolve this issue the Commission should evaluate each equipment item in Mr. Weber's Exhibit NW-D-4 and ask the following questions:

- Does the item have a capacity limitation?
- If so, what is the measure of capacity, or the measure of demand that exhausts capacity – lines in service, call attempts, minutes of use or other?
- And, most importantly, is the RLEC's future demand expected to exhaust capacity of the item, such that additional capacity must be placed at additional investment and cost?

With respect to the third question, the FCC Common Carrier Bureau's finding in the 2003 *Virginia Arbitration Cost Order* provides guidance. The Bureau decided that none of the "getting started" costs of traditional time division switches are usage-sensitive, though the logic of its decision applies in general.[17]

> We conclude . . . that the "getting started" cost of the switch is a fixed cost, meaning that it does not vary with the number of ports or the level of usage on the switch. We find here that the "getting started" costs of the switch should be recovered on a per line port basis. "Getting started" costs are incurred for capacity that is shared among subscribers. Verizon incurs these costs to be ready to provide service upon demand. Given the record evidence that modern switches typically have large amounts of excess central processor and memory capacity, the usage by any one subscriber or group of subscribers is not expected to press so hard on

[17] "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 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).

> processor or memory capacity at any one time as to cause call blockage, or a need for additional capacity to avoid such blockage. Thus, no one subscriber or group of subscribers is any more or any less causally responsible for the processor or memory capacity costs. Principles of cost causation, therefore, support a per line port cost recovery approach because, more than any other approach, it spreads getting started costs to carriers in a manner that treats equally all subscribers served by a switch.[18]

Q. Please briefly discuss the remaining issues with Mr. Eklund's testimony.

A. On page 12, Mr. Eklund states that "The FLEC model uses the FCC's authorized rate-of-return of 11.25 percent as the forward-looking capital cost," suggesting that capital costs are properly calculated in the cost studies. This is not the case. I pointed out in my direct testimony on pages 33-34 that the FCC's 11.25 percent authorized rate of return reflects a mix of debt and equity capital, whereas the RLEC cost studies assume 100 percent equity capital at a cost of 11.25 percent. This error is significant for Kennebec, because it is subject to income taxes. Kennebec currently has debt capital, and income taxes are overstated without the inclusion of debt in its capital structure.

Also on page 12, Mr. Eklund states that a reasonable allocation of forward-looking common costs is included in the cost studies. Common cost allocations or corporate operations expense loadings are quite high for several of the RLECs. For example, switching corporate operations expense loadings

[18] *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 manufacturers today design

are 10.8 and 11.0 percent for two RLECs and 13.8 to 21.6 percent for the others. I discussed this issue in my direct testimony on pages 37-39, 68 and 79. FCC Rule §51.505(c) defines forward-looking common costs as costs "efficiently incurred," and Mr. Eklund provided no proof that the high corporate operations expense loadings for several RLECs represent costs that are efficiently incurred, particularly compared to their peers.

The issues related to capital costs and the corporate operations expense loadings relate to Cost Issues 1.2, 2.5 and 3.2 in Exhibit WCC-R1. Adjustments also are necessary to some RLEC direct expense factors and other operating expense factors. These adjustments are described in my direct testimony in sections covering Cost Issues 1.2, 2.5 and 3.2.

On page 15, beginning on line 20, Mr. Eklund describes adjustments made to transport electronics and outside plant investments to eliminate or remove portions of the investments attributable to uses other than the transport systems carrying mobile-to-land traffic (*e.g.*, interoffice cable fibers used for CATV and other special purposes). There are significant errors, though, in these adjustments that I describe in my direct testimony. A portion of transport outside plant investment is allocated to transit circuits, but no transport electronics investment is allocated to transit circuits, as it should

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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. . . .").

be.[19] In addition, the allocation of transport electronics and outside plant investments between voice trunks and special circuits is based on the "path" method, which I indicated earlier is incorrect and results in extraordinarily high transport costs per minute. Mr. Eklund's description of the RLEC cost study adjustments to transport investments is so high-level that it fails to reveal these errors.

Q. Turning to Mr. Weber's testimony, did he provide evidence to demonstrate that switch and transport investments used in the RLEC cost studies comply with FCC rules?

A. No. Mr. Weber did not explain why the same switch equipment configurations were assumed for host and non-host switches, when demand varies widely among switches, and Metaswitch offers more than one softswitching solution. He did not show that OC-192 interoffice rings are necessary or result in the lowest cost alternative for interoffice transport. Mr. Weber did not explain how Web Self-Care, CALEA software, Centrex software and other switch components are necessary to terminate a mobile-to-land call. He did not show how media gateway chasses, Call Agents and other switch equipment are usage-sensitive; *i.e.*, the capacity of the equipment is exhaustible by an RLEC's expected demand, such that additional traffic causes the need for additional capacity and causes incremental investment and costs.

[19] See Conwell Direct Testimony, p. 64.

With respect to transport costs, Mr. Weber failed to explain the rationale for using "paths" as the measure of demand, when it is apparent that transport electronics *base*, *line* and *tributary* equipment capacity is consumed by the number of transport circuits and their bandwidth. He did not explain why transit circuits are included in the allocation of transport outside plant, but not transport electronics. More importantly, he did not explain why transit circuits were excluded from total demand in calculating transport electronics costs.

Q. Did Mr. Weber provide any information that revises your previous understanding of the RLEC cost studies?

A. There was one item I noted in Mr. Weber's testimony that is different from the description of the RLEC cost studies that I gave in my supplemental direct testimony. On page 5 of his testimony in discussing switch architecture, he indicated that 'centralized Call Agents are assumed to be deployed at each "host" switching location.' In my supplemental direct testimony, I indicated that 'A pair of CAs is deployed in each exchange, or at each host and "non-host switch."'[20] There are Call Agents only at host switches, and not at non-host switches.

Q. Does this alter the point you were making in your testimony?

[20] See Conwell Supplemental Direct Testimony, pp. 9-10.

A. No, I was making two points in my testimony regarding Call Agents, and these points remain the same. First, Call Agents appear to have such large capacity to handle busy hour call attempts, that RLEC usage is not likely to exhaust Call Agent capacity, thus causing additional capacity requirements and investment. In other words, usage, and in particular the termination of mobile-to-land calls, does not cause additional Call Agent investment and costs; therefore, these costs are not recoverable in reciprocal compensation. Second, the Call Agent supplier, Metaswitch, offers an "integrated softswitch option," which appears to provide a lower cost option. To the extent this is a technically feasible alternative, it may result in a more efficient network configuration. The RLECs should respond as to whether this or other alternatives is feasible and results in lower switch investment and ultimately lower termination costs per minute.

RESOLVING COST ISSUES AND ESTABLISHING APPROPRIATE RATES

Q. How do you recommend that the Commission proceed to resolve the cost issues in Exhibit WCC-R1 and establish appropriate transport and termination rates?

A. In this arbitration, the RLECs are required to establish transport and termination rates based on their forward-looking economic costs. These costs must comply with FCC Rules §§51.505 and 51.511. The determination of forward-looking economic costs should not be difficult. It is largely a matter

of the Commission deciding specific input values to the RLEC cost studies that yield valid cost measures.

To assist in this process, I prepared *templates* for use by the Commission in deciding input values for switching, transport electronics and transport outside plant costs. These are included in my testimony as Exhibits WCC-R2, WCC-R3 and WCC-R4. I recommended appropriate input values in my direct and supplemental direct testimony, based on information provided by the RLECs in response to Alltel interrogatories or publicly available information. When I was not able to recommend an appropriate input value, such as the projected quantity of equivalent DS-1 circuits for the RLEC's own use and for the use of other carriers, I specified the required values to be provided by the RLEC. I anticipate the RLEC witnesses will respond to these recommendations in their reply testimony. The Commission then can weigh the evidence and decide appropriate input values.

Q. If the RLECs produce new evidence in response to the 18 cost issues, should you be allowed to offer comments to the Commission on this evidence?

A. Yes, if the RLECs produce additional cost study documentation or other evidence, for example, to justify OC-192 interoffice rings, I request the opportunity to comment on this evidence. Given the current schedule for the arbitration, if the Commission desires, I can make these comments in a brief

statement at the hearing after my testimony is formally introduced in the record and prior to cross-examination.

Q. Please explain the template for switching costs shown in Exhibit WCC-R2?

A. The template for switching costs is a simple spreadsheet that calculates the cost per minute to terminate Alltel mobile-to-land traffic. The spreadsheet contains input values contained in the RLEC cost study and values recommended by Alltel when the RLEC input values fail to comply with FCC rules. The spreadsheet has empty cells for the Commission to adopt either of these input values or select others based on the evidence. Alliance's switching cost calculations are used as the example.

The template or spreadsheet begins with switch investments for each Alliance exchange in rows 9-14. Investments are shown separately for *common* switch plant and *trunk cards*. Input values from the RLEC cost studies are shown in columns B and C, and the values Alltel recommends based on current information are shown in columns D and E.[21] In resolving Cost Issues 1.1 and 1.3, the Commission is asked to decide the input values to place in cells F9-G14.

[21] If lower cost configurations of switch equipment are feasible, this would lower investments used to compute forward-looking economic costs, and these lower investments would be recommended by Alltel in compliance with FCC Rule §51.505(b)(1).

Q. What should the Commission consider in deciding the *common* and *trunk card* investments?

A. As I discussed earlier, the Commission must decide which equipment items reflected in *common* investment in Mr. Weber's Exhibit NW-D-4 are not attributable to terminating Alltel mobile-to-land traffic. These include Web Self Care, CALEA licenses, Centrex licenses and perhaps others. Investments for any equipment not used to terminate mobile-to-land traffic must be excluded.

The Commission must ascertain whether different switch configurations result in lower investments while satisfying service requirements and meeting demand. If lower cost configurations are possible, especially for small exchanges, the lower *common* investments must be substituted for those in column B of Exhibit WCC-R2.

Finally, the Commission must determine whether the remaining *common* equipment is usage-sensitive. This must be equipment in which mobile-to-land traffic causes additional capacity requirements, investment and costs. Based on the information produced by the RLECs, I have recommended that no *common* investment be treated as usage-sensitive.

With regard to *trunk card* investment, the Commission must determine whether the types of trunk cards and trunk card quantities represent the lowest

cost configuration. Cost Issue 1.4 asks the Commission to determine the quantity of annual minutes per switch trunk card that represents efficient utilization. This determination will likely affect the line-to-trunk ratio in the cost studies and the type of trunk cards assumed for host and non-host switches, and may lower the trunk card investments currently recommended by Alltel. (See footnote in Exhibit WCC-R2.)

Q. What next must the Commission decide?

A. The Commission must decide switching annual cost factors for Cost Issue 1.2. The template shows that Alltel recommends different cost factors from those in the RLEC cost studies. The Commission is asked to decide values for cells D21-D24.

Q. Is there anything else for the Commission to decide on switching cost issues?

A. No, at this point the calculations carry forward to the results. Alliance's cost study estimated switching costs of [redacted] per minute (cell C34), based on the input values shown in the template. However, when the Commission determines that little, if any, switch *common* investment is usage-sensitive, adjusts trunk card investments for efficient utilization and corrects the annual cost factors, Alliance's switching cost per minute will be approximately [redacted] (cell E34). This is the cost per minute resulting from input values

recommended by Alltel, and this is the forward-looking economic cost for switching that Alliance is permitted to recover in reciprocal compensation.

Q. Please describe the transport electronics template.

A. The template for resolving issues related to transport electronics costs is shown in Exhibit WCC-R3 (two pages). West River is used in this example, because it is one of two RLECs that provided information on transit circuits needed to determine total demand.

Rows 9-20 contain transport electronics investment for each exchange divided between *base* and *line* investment and *tributary* investment. Columns B and C contain the investment values in the RLEC cost studies. These represent the investments in OC-192 transport equipment.

Columns D and E contain Alltel's recommended values for these investments. As I will discuss shortly, West River indicated in its cost study and responses to Alltel interrogatories, that its total demand for interoffice transport is well below that necessary to justify an OC-192 transport system. So, I have modified its *line* investments to substitute lower capacity and lower cost OC-48 optical interface cards for the OC-192 cards assumed in the study. OC-48 cards cost [redacted] versus [redacted] for an OC-192 system.[22] Using OC-48

22 [redacted]

optical interface cards results in a [redacted] percent reduction in *line* investment in each exchange, and lowers the base and line investment per exchange from [redacted]. The tributary investments in column E are the same as those in the RLEC cost study, though these may change with changes in projected total demand. In resolving Cost Issue 2.1, the Commission is asked to decide the input values to place in cells F9-G20.

Q. What should the Commission consider in deciding transport electronics investment?

A. First, the Commission must ascertain future total demand on interoffice transport rings including the RLEC's own circuits for all services to be rendered and those circuits forecast to be used by other carriers. Total demand should be a projected value during some reasonable period.

Second, the Commission must determine whether an OC-192 transport system represents the most efficient network configuration. West River has indicated that total demand for transport including its own circuits and transit circuits is the equivalent of [redacted] DS-1 circuits (cells D40-42). An OC-192 transport system has nominal capacity for [redacted] percent or [redacted] times this level of demand.[23] An OC-48 transport system with significantly lower *line* investments and costs, or even a smaller transport system, is more than

[23] A measure of the nominal capacity of an OC-192 transport system would be 5,376 equivalent DS-1 circuits. This would be 192 DS-3 circuits with 28 DS-1 circuits per DS-3.

adequate, unless West River projects substantial additional demand from new services, such as video, broadband, *etc.*

Q. If West River and the other RLECs can justify OC-192 transport systems, does this mean their transport electronics costs are valid?

A. No, transport system size, investment and costs and projected total demand are interrelated. If OC-192 transport systems are justified, this means that West River's projected total demand is greater than the amount in its study [redacted] equivalent DS-1 circuits in cell D42). In this case, transport electronic costs per circuit (cells D44 and E44) and per minute (cell E53) are reduced substantially.

Q. What is the next issue to be decided by the Commission?

A. I talked about Cost Issue 2.1 dealing with the proper transport electronics investments. I'll jump to Cost Issue 2.5 related to annual cost factors. Cells B27-B30 contain the annual cost factors in West River's cost study, and cells C27-C30 contain those recommended by Alltel. They are not that different. In fact, the common set of values recommended for capital costs, direct expenses, *etc.* in some cases are greater than the values in West River's cost study and lower than others. Overall, Alltel recommends that transport electronics annual costs be no more than 32.5 percent of investment. The Commission is asked to decide values in cells D26-D30, or it can simply select the total annual cost factor in cell D31. Kennebec has a high transport

electronics annual cost factor [redacted] percent), so a change in its annual cost factor is significant.

Q. Please describe the next step in the transport electronics template.

A. Once investment amounts and annual cost factors are determined, annual costs can be computed (row 36). The next step in the template is very important.

Row 38 shows the measure of demand or capacity consumption for transport electronics. West River and the other RLECs use "paths," and Alltel recommends equivalent DS-1 circuits. I have explained in my supplemental direct testimony using information from the RLECs why "paths" are inappropriate, and equivalent DS-1 circuits is a more appropriate measure. The Commission is asked to decide between these two measures (cells F38 and G38). This is Cost Issue 2.2.

Once that decision is made, the next decision is whether to include transit circuits in the total demand used to compute unit costs. This is Cost Issue 2.3 and relates to row 41 in the template. The RLEC cost studies, in effect, do not include transit circuits in total demand, when computing transport electronics unit costs. They must include this demand per FCC Rule §51.511. Alltel's position for West River is that [redacted] equivalent DS-1 circuits should be added to its own [redacted] equivalent DS-1 circuits to determine the total demand served by transport electronics plant.

Q. Could this figure be higher when demand is based on a future projection?

A. Yes, the RLECs presumably are anticipating substantial growth in interoffice transport for special circuits and broadband applications. The Commission must require the RLECs to develop projections of total demand for Cost Issue 2.4. The resulting total demand figures likely will be significantly greater than recent demand reflected in the cost studies. I expect West River's projected total demand to be greater than [redacted] equivalent DS-1 circuits, resulting in lower transport costs.

The Commission is asked to decide for Cost Issue 2.3 whether transit circuits are to be included in total demand and to select values for cells F41 and G41. It also is asked to decide total demand for Cost Issue 2.4, which covers the RLEC's own demand and transit circuits on a projected basis. Values then must be decided that determine total demand in cells F42 and G42. The decisions to this point will enable transport electronics investments and costs per unit (equivalent DS-1 circuit) to be calculated consistent with FCC Rules §§51.505 and 51.511. These values are shown in cells D44 and E44.[24]

Q. Please describe the remainder of the template.

[24] The amounts shown in cells B44 and C44 are "per path" for the RLEC cost study, and the amounts shown in cells D44 and E44 are "per equivalent DS-1 circuit," so the amounts are not directly comparable.

A. Once annual costs per equivalent DS-1 circuit are properly computed, these costs are divided by the quantity of voice trunks per DS-1 to determine the annual cost per voice trunk. Using the "path" method, West River computes annual costs of [redacted] per path or voice trunk (cell B44 and C44). Using equivalent DS-1 circuits and including transit circuits results in annual costs of [redacted] per voice trunk (cells D47 and E47).

The next step, and final issue related to transport electronics, is to determine efficient utilization of voice trunks in terms of annual minutes per trunk. Alltel has recommended trunk utilization for West River of [redacted] annual minutes consistent with FCC Rule §51.513(c)(4). The value in West River's cost study is only [redacted] minutes or [redacted] percent of the FCC standard for efficient utilization of voice trunks. The Commission is asked to decide annual minutes per trunk for cells F50 and G50.

With the Commission's decisions on Cost Issues 2.1-2.6, this will resolve the final issue, Cost Issue 2.7, resulting in a transport electronics cost per minute that complies with FCC rules. West River's cost study yield a cost of [redacted] per minute, and the Alltel recommendations, before further adjustments to transport electronics investments for lower cost configurations or increases in projected total demand, result in a cost of [redacted] per minute (row 53). West River has overstated its transport electronics cost by a factor of [redacted] by:

- Assuming a transport system (OC-192) that is too large or understating total demand,
- Using "paths" as the measure of demand,
- Excluding the demand of other carriers (transit traffic) from total demand,
- And, reflecting inefficient trunk utilization (annual minutes per trunk).

The Commission can correct these errors, and similar errors by the other RLECs, by selecting appropriate input values.

Q. Please describe the template for transport outside plant costs.

A. The template for transport outside plant costs is shown in Exhibit WCC-R4. This spreadsheet shows the calculation of costs of interoffice cables used to connect wire centers to which Alltel mobile-to-land traffic is transported. West River is again used as the example.

The template begins with the total miles of interoffice cable. West River's cost study includes [redacted] miles of cable connecting its wire centers. Alltel has recommended that [redacted] miles be used. This mileage reflects West River's actual cable mileage of [redacted] miles, less [redacted] miles for cable that does not appear to be used to transport Alltel's mobile-to-land traffic.[25] Cost Issue 3.1 asks the Commission to decide the transport mileage for cell D8 that

[25] See Conwell Direct Testimony, pp. 76 and 81.

represents the most efficient configuration of interoffice cable and including only cable segments used to transport Alltel's mobile-to-land traffic. Once an appropriate input value for transport mileage is determined, forward-looking cable investment can be calculated based on 5,280 feet per mile and West River's average cable investment per foot ([redacted] in row 10).

Q. What is the next cost issue?

A. Cost Issue 3.2 asks the Commission to decide annual cost factors for transport outside plant. Santel, West River and Beresford transport outside plant annual cost factors were reasonable, whereas those of Alliance, Kennebec and McCook were too high. In Exhibit WCC-R4, the West River annual cost factors and Alltel's recommendations are the same. They would be different for three of the RLECs. In the table of cost issues and recommendations in Exhibit WCC-R1, the Commission is asked to limit the transport outside plant annual cost factor to 27 percent. The proper factors would be inserted in cells D14-D18. Total cable annual costs then are computed in row 20.

The RLEC cost studies next allocate total cable annual costs between the transport system carrying mobile-to-land traffic and other uses of fibers in the interoffice cables (*e.g.*, CATV and others). Unlike their cost calculations for transport electronics, they also allocate cable costs between their own circuits and those of other carriers. Approximately [redacted] percent (cell B22) of West River's total cable annual costs are allocated to the transport system versus

other uses. I have used a slightly higher percentage in column C ([redacted] percent), because I have handled subsequently in the spreadsheet (row 25) the allocation of transport cable annual costs between West River's own use and the use of other carriers. The percentages of cable costs attributable to transport are multiplied times the total cable annual costs to determine transport cable annual costs (row 23).

Q. Is the remainder of the template the same as that for transport electronics costs?

A. Yes, the Commission is asked to use the same measure of transport demand – equivalent DS-1 circuits. The input values used for Cost Issues 3.3 and 3.4 will be the same as those selected for Cost Issues 2.4 and 2.6, respectively. Once the Commission decides appropriate transport mileages and annual cost factors, and adopts the measures of demand used in computing transport electronics costs, the calculations flow quickly to the results.

West River's cost study produced transport outside plant costs of [redacted] per minute. When West River's actual transport mileage is used (row 8), total demand is based on equivalent DS-1 circuits (row 25) and annual minutes per voice trunk (row 31) are based on the FCC standard, the forward-looking economic cost of transport outside plant is [redacted] per minute.

Q. What do you recommend after the Commission has determined appropriate input values for the RLEC cost studies?

A. Based on my experience in other arbitrations, the RLECs would prepare revised cost study assumptions and input values. These would include, for example, project total demand for transport, the sizing of transport systems, *etc.* Alltel should be permitted to review these revisions and offer comments to the RLECs and the Commission. Once agreement is reached on the cost study revisions, the studies would be re-run. Rates for transport and termination in compliance with FCC rules can then be established.

Q. Does this conclude your reply testimony?

A. Yes.