BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE PETITIONS OF MCCOOK COOPERATIVE TELEPHONE COMPANY, KENNEBEC TELEPHONE, 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 07-112 TC 07-114 TC 07-115 TC 07-116

PUBLIC

REPLY TESTIMONY OF W. CRAIG CONWELL ON BEHALF OF ALLTEL COMMUNICATIONS, LLC. IN RESPONSE TO REVISED RLEC COST STUDIES

July 3, 2009

Table of Contents

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 testimony on three occasions. On March 24, 2008, I filed direct testimony on behalf of Alltel Communications, LLC ("Alltel"). On June 12, 2008, I filed supplemental direct testimony, and on July 7, 2008, I filed reply testimony. I also testified in the hearing before the South Dakota Public Utility Commission (the "Commission") held July 29 through July 31, 2008.

Q. What is the purpose of your present testimony?

A. This testimony is to respond to the supplemental testimonies of Messrs. Tim Eklund and Nathan A. Weber filed with the Commission on April 24, 2009. Their testimonies introduced the results of revised cost studies of the rural local exchange carriers (RLECs) remaining in this case.[1] The cost study "re-runs" were performed in response to changes in the studies required by the Commission in its February 27, 2009 order (the "Order").[2] I will describe my

[1] The four remaining RLECs are: McCook Cooperative Telephone Company, Kennebec Telephone Company, Santel Communications Cooperative and West River Cooperative Telephone Company.

[2] "Findings of Fact, Conclusions of Law; Notice of Entry of Order," "In the Matter of the Petition of McCook Cooperative Telephone Company for Arbitration Pursuant to the

findings from reviewing the re-runs, whether these studies comply with the Commission's Order and FCC rules, and whether the resulting transport and termination costs are permissible for establishing reciprocal compensation rates between the individual RLECs and Alltel.

SUMMARY OF TESTIMONY

Q. What is your overall impression of the revised cost studies?

A. I have reviewed scores of RLEC cost studies in twelve arbitrations in ten States. The revised cost studies arguably are the most incredible that I have seen. These "studies" contain fundamental internal inconsistencies, beyond inconsistencies with the Commission Order and FCC rules. The studies make extraordinary revisions to input data in the original cost studies, with little, if any, substantiation. The studies increase, rather than reduce, proposed transport and termination rates beyond levels that defied credibility in the first place.

Q. What are the main points of your testimony?

A. There are four main points that I will make in my testimony. I ask the Commission to consider these before deciding reciprocal compensation rates for IntraMTA Traffic pursuant to 47 U.S.C. section 252(d)(2) and the FCC rules.

Telecommunications Act of 1996 to Resolve Issues Relating to an Interconnection Agreement with Alltel Communications, Inc.," TC07-112, entered February 27, 2009.

1. The revised RLEC cost studies do not comply with the Commission's Order. The studies continue to improperly allocate transport costs between special/dedicated circuits and switched circuits/voice trunks. Specifically, the rate equivalent ratios used to equate DS-3, DS-1 and DS-0 special circuits to voice trunks are invalid for this purpose.[3] Demand for transit circuits still is measured in terms of "paths" resulting in an underestimation of the demand for transit and the proportion of transport costs attributable to this demand. Furthermore, the revised forecasts of transport demand are invalid and inaccurate. The result is that the new transport cost estimates are grossly overstated. The revised switch investments reflecting the removal of certain switch components is undocumented, unsupported and, therefore, lacking proof. The RLECs have dramatically lowered switched transport and total switched minutes of use driving transport and termination rates upwards.[4] While I respectfully recognize the Commission decided the issue of usage-sensitive switching costs in its Order, the RLECs have inadvertently produced evidence that supports Alltel's previous position that switch

[3] The rate equivalent ratios are appropriate for equating quantities of DS-0 and DS-3 special circuits to DS-1 special circuits on a cost or rate equivalent basis. However, because voice trunk costs are not the same as DS-0 special circuit costs the rate equivalent ratio cannot be used to equate quantities of voice trunks to DS-1 transport circuits.

[4] "Switched transport minutes" refers to minutes of use (voice calling) among RLEC switches – interoffice calling. "Total switched minutes" refers to the sum of switched transport minutes (among switches) plus intraoffice calling (calls from one subscriber line served by a switch to another served by the switch that does not require interoffice transport). Switched transport minutes represent the demand for voice traffic over transport electronics and outside plant, and the switch trunk portion of switching plant. Total switched minutes represent the demand for the switch processor portion of switching plant.

processor investment and costs are non-usage sensitive, and I believe it is important to note this information.

2. The RLEC cost study re-runs fail to comply with FCC rules in 47 C.F.R. §§51.505 and 51.511 that govern the establishment of reciprocal compensation rates. The cost study results, ranging from [redacted] per minute for transport and termination, grossly exceed the RLECs' *forward-looking economic costs* and cannot be used to establish reciprocal compensation rates. I will provide transport and termination costs for each RLEC reflecting corrections to the revised studies; however, additional information is necessary to fully correct the studies.

3. The RLECs have failed to meet their burden of proof. Alltel has been denied information sufficient for review. We should be reminded that the FCC places the burden to prove the validity of their cost studies on the RLECs, not Alltel. Section 51.505(e) of the FCC rules is clear regarding cost study requirements: "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." The Commission should note that the RLECs have failed in the following and more:

   a) Failed to project demand "during a reasonable measuring period" (§51.511(a)). Demand is projected to 2010 or for only two years of the ten-year life of transport electronics. Much of the demand that

causes future transport costs – demand for special/dedicated services – is after 2010. Much of the cost burden for future broadband services is being placed on users of basic voice services, including Alltel.

b) Failed to project "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" (§51.511(a)). RLEC demand forecasts do not include demand for future broadband services that are the prime causers of transport and switching costs.

c) Failed to prove that an OC-192 transport system represents the "lowest cost network configuration" (§51.505(b)(1)). Consequently, transport costs are bloated. As was pointed out in the hearing, the total transport demand projected by the RLECs could be served by a much smaller transport system. In the revised cost studies, the RLECs have projected transport demand that still fails to require an OC-192 transport system.

d) Failed to prove that future voice trunks are configured for "efficient network configuration" (§51.505(b)(1)). The quantities of annual minutes per voice trunk were extraordinarily low in the original cost studies, resulting in excessive transport costs.[5] In the revisions of their

[5] *Id.*, see para. 19-20. The Commission rejected Alltel's use of benchmarks for annual minutes per trunk based on FCC Rule §51.513 and the HAI 5.0a model; however, the RLECs produced no evidence to validate that the original cost studies reflected the "lowest cost network configuration" of voice trunks given switched transport demand. In the revised cost

cost studies the RLECs have, incredibly and without explanation, reduced voice trunk utilization, further driving-up transport costs.

e) Failed to reduce switch processor investment and costs as switch usage (total switched minutes of use) declined sharply from the original to the revised cost studies. This raises the question of whether switch processor costs in the revised cost studies are "directly attributable to, or reasonably identifiable as incremental to" the termination of Alltel's mobile to land traffic (§51.505(b)).[6]

f) Failed to provide details on the unit investments, capacities and expected utilization of switch processor components "sufficient for purposes of review" (§51.505(e)(2)). The RLECs say they have provided details of switch processor costs, but they have not.

4. The RLEC cost studies must again be revised to comply with the Commission's Order and FCC rules. I have made corrections to the RLEC cost study re-runs to comply with the Commission Order and FCC rules resulting in substantial reductions in transport and termination costs. However, other corrections are required for these studies to comply with FCC rules, and information is needed from the RLECs to make these corrections. Consequently, it will be necessary for the RLECs to again

---

studies, the RLECs have reduced switched transport demand and again offered no proof of efficient trunk equipment configuration.

[6] As described later in the testimony, the RLECs have substantially lowered initial switch usage (annual switched minutes of use as of 2010), and there is no change in switch processor investment and costs. In addition, voice traffic demand is expected by the RLECs to decline – not grow – meaning that future switch usage will not cause additional capacity requirements, investment and costs.

revise the cost studies before proper reciprocal compensation rates can be established.

Q. What are the results of the corrections made to the revised cost studies?

A. The following table provides transport and termination costs from the RLECs revised cost studies and two sets of corrections. The first set of corrections leaves switch processor costs in the cost study. The second set of corrections removes switch processor costs based on the new evidence of no change in these costs as the RLECs dramatically lowered switch usage.

Transport and Termination Costs Per Minute

Company	Cost Study Re-runs	Corrected Cost Study Re-Runs w/o Removal of Switch Processor Costs	Corrected Cost Study Re-Runs w/ Removal of Switch Processor Costs
McCook	$ [redacted]	$ [redacted]	$ [redacted]
Kennebec	$	$	$
Santel	$	$	$
West River	$	$	$

RESPONSE TO THE TESTIMONY OF RLEC WITNESSES

Q. What was the purpose of Mr. Eklund's testimony?

A. Mr. Eklund described three changes made to revise the RLEC cost studies. Transport costs were redistributed between special/dedicated circuits and switched circuits. Costs of certain switching components were removed. And, transport costs were recalculated based on new demand forecasts.

Q. Are there issues with these changes?

A. Yes. There are severe errors in the redistribution of transport costs between special circuits and switched circuits. The basis for removing the costs of switching components is unsupported; and, the demand forecasts are unsupported, improper and incorrect.

Q. Before responding to Mr. Eklund's testimony, would you briefly refresh the description of RLEC transport and termination costs?

A. Yes. The components of transport and termination costs are shown below in the results of McCook's cost study re-run[7]. McCook's new estimate of transport and termination costs is $[redacted] per minute, or almost [redacted] per minute. The transport and termination cost consists of four components – *switch trunk*, *switch processor*, *switched transport electronics* and *switched transport outside plant*.

Switch trunk ([redacted]) represents the costs of switching equipment used to combine voice trunks to DS-1 circuits for transport over the interoffice network. The equipment provides the interface to the interoffice transport system. Switch processor ([redacted]) is actually a misnomer. The costs in this category represent much more than a switch processor. The category includes all switching plant other than switch trunk equipment, equipment used to terminate subscriber lines and a small amount of plant for vertical

[7] Throughout the testimony I will refer to McCook's revised cost study by way of example. The same errors exist for all companies.

services. It includes plant for call servers, media gateways, spares and other.[8] The two categories of switch plant are charged to Account 2212 in the FCC's Uniform System of Accounts.

Switched transport electronics ([redacted] consists of transmission or circuit equipment used for the interoffice transport system carrying special circuits and switched circuits among McCook's central offices. The equipment is used to add and drop circuits to and from the transport system, multiplex circuits to higher bandwidth interoffice channels, generate optical transmission signals, *etc.* Transport electronics investment is charged to Account 2232. Switched transport outside plant ([redacted]) is the interoffice cable that provides a transmission medium between central offices. The RLEC cost studies assume interoffice cables are [redacted]fiber, buried cables (Account 2423). The calculations of these costs by McCook's witnesses as set forth in the table below were taken from materials provided by the RLEC.

[8] *See* "Pre-Filed Supplemental Testimony of Nathan A. Weber on Behalf of McCook Cooperative Telephone Company, Kennebec Telephone Company, Inc., Santel Communications Cooperative, Inc., and West River Cooperative Telephone Company, Inc.," filed April 24, 2009, Exhibits NW-S-1 through NW-S-4. Lines 1-22 of the exhibits identify the switch processor or "common" components of switching.

FLEC Model
Transport & Termination Report

McCook Cooperative Telephone
Run 16

		FLEC Annual Cost	FLEC Demand	FLEC Cost /unit	FLEC units
1	**Switching Costs**				
2	Switch Line	$			
3	Switch Trunk	$		$	$/minute
4	Switch Processor	$		$	
5	**Total Switch**	$		$	$/minute
6					
7					
8					
9	**Transport Costs**				
10	Switched Transport Electronics	$		$	$/minute
11	Switched Transport Outside Plant	$		$	$/minute
12	**Total Switched Transport**			$	$/minute
13					
14					
15	non Switched Transport Electronics	$			
16	non Switched Transport Outside Plant	$			
17					
18	**Total Transport**	$			
19					
20					
21	**Total Transport and Termination**			$	$/minute

Q. What are the results of the cost study re-runs, and how do they compare with the original cost study results?

A. The following table shows the results of the original cost studies and the cost study re-runs. These are the same results shown in Table 13 of Mr. Eklund's testimony; however, he did not show the percentage difference in the results.[9]

Transport and Termination Costs Per Minute

Company	Original Cost Study	Cost Study Re-Run	Percentage Difference
McCook	$		11%
Kennebec	$		
Santel	$		18%
West River	$		30%

[9] Santel made a subsequent correction to its cost study re-run that lowered its transport and termination cost in from [redacted] in Mr. Eklund's Table 13 to [redacted] per minute.

It is understandable why his "comparison" of results did not highlight the fact that transport termination costs per minute increased for all four RLECs, with double-digit increases for three companies. The changes directed by the Commission were expected to reduce study results, not raise the proposed rates to Alltel by upwards of 30 percent. The results are unbelievable.

Redistributing costs from switched circuits, carrying Alltel mobile-to-land traffic, to special circuits should have lowered costs. Removing some switching investment and costs should have lowered costs. And, basing transport costs per minute on forecast demand expected to be growing should have lowered costs. Instead, revising the cost studies raised costs and the RLECs' proposed rates. This occurred because the RLECs still do not properly allocate transport costs to transport demand, oversize the transport network based on demand forecasted, and show no reduction in switch processor costs although reducing switched traffic by as much as [redacted] per cent (illustrating that the costs are not usage-sensitive).

Revised RLEC cost studies incorrectly redistribute transport costs.

Q. Let's begin with the first change to the RLEC cost studies – the redistribution of transport costs between special circuits and switched circuits. Which of the four elements of transport and termination costs does this change affect?

A. The change affects the costs of transport electronics and transport outside plant. The total costs of transport electronics and transport outside plant are allocated between special circuits and switched circuits in proportion to the demand for each.

Q. Mr. Eklund describes in his testimony the methods for distributing transport costs proposed by the RLECs and Alltel. Is Mr. Eklund description accurate?

A. No, it is not. Mr. Eklund gives the following testimony on page three regarding Alltel's position:

> The RLECs and Alltel agree that there must be an allocation made for special services circuits in the FLEC Study's allocation of transport cost. However, the parties disagree with regard to the appropriate allocation methodology. The FLEC study used during the arbitration proceeding counted special circuits based on a circuit count. The RLECs described this method as the Path method. Alltel claimed that a DS-1 or Bandwidth method should be used. The FCC requires only that an allocation be reasonable, but does not direct an exact method of allocation. Based upon the disproportionate allocation of costs to special services caused by the use of the DS-1/Bandwidth method, the RLECs submit that the use of such method is not reasonable. In fact, as I discussed in my rebuttal testimony filed in each of the four dockets, if Alltel's method was used (allocating 24 times more cost for a DS-1 than a DS-0 and 672 times more cost for a DS-3 than a DS-0), it would result in prices for DS-1 services and DS-3 services that would be so high, there would be little or no demand for such services. (Emphasis added.)

Alltel is not proposing the method Mr. Eklund refers to as the "DS-1/Bandwidth method." I made this clear during the hearing as the RLECs'

counsel cross-examined me on this subject.[10] The method that I recommended during the hearing is similar to the first of two methods I originally proposed in my direct testimony filed March 28, 2008, except the relationship between DS-1 and DS-3 circuit rates is used as a surrogate for their costs.[11] It is important to note that the method adopted by the Commission in its Order, with the critical exception for how demand for switched circuits or voice trunks are measured, is the same as the method I described during the hearing.[12] The Commission is aware that the position attributed by Mr. Eklund to Alltel is incorrect. In paragraph 25 of the Order, the Commission stated the following:

> 25. Alltel opposed the use of the path method claiming that it over-allocated transport electronics investment to voice trunks causing the transport electronics cost per minute to be too high. Alltel Ex. 2 at 58. Alltel advocated the use of a DS-1 equivalent method. Alltel Ex. 4 at 35. Under the DS-1 equivalent method, DS-0 voice trunks are converted to a DS-1 level by taking the total DS-0 voice trunks and dividing by 24. Alltel Ex. 9. As explained *supra*, a DS-1 is equivalent to 24 DS-0s. McCook opposed the DS-1 equivalent method asserting that under the rationale of a DS-1 equivalent method, the rate for a DS-1 would be 24 times higher than the rate for a DS-0. Pet. Ex. 50 at 19. The rate of a DS-3 would be 28 times higher than the rate of a DS-1 or 672 times higher than a DS-0. *Id.* Such rates would likely significantly reduce demand for DS-1s and DS-3s. *Id.* at 20-21. Alltel recognized the validity of this argument, but only for DS-3s, by stating in its brief that the cost of a DS-3 circuit is not 28 times that of a DS-1. Alltel Brief at 23. Alltel agreed to express DS-3 circuits as equivalent to seven DS-1 circuits. *Id.* (Emphasis added.)

[10] "Transcript of Proceedings," Vol. III, July 31, 2008, pp. 43-443.

[11] *See* "Direct Testimony of W. Craig Conwell," March 28, 2008, pp. 58-60.

[12] The method for measuring voice trunk demand should be to divide the quantity of voice trunks by 24 or the projected number of voice trunks per DS-1 transport circuit.

Alltel's position has been that transport costs should be measured to reflect the differences in costs of circuits of differing bandwidth and that treating each circuit as having the same cost (as the "path method" did in the original RLEC cost studies) was flatly incorrect. In the cost study re-runs, the RLECs have recognized differences or ratios in rates for DS-3 and DS-1 special circuits ranging from [redacted] to [redacted] for three companies, and [redacted] for West River. [13] These ratios of DS-3-to-DS-1 special circuit rates are in line with Alltel's seven-to-one recommendation. (Alltel's recommendation turns out to be conservative for West River.) Alltel, however, maintains that the quantity of voice trunks must be divided by 24 voice trunks per DS-1 transport circuit to properly reflect the relationship between the costs of voice trunks and DS-1 circuits. I later will describe in detail the rationale and validity of this method.

The record is clear on Alltel's position on this issue. Either Mr. Eklund did not hear my testimony during the hearing or read the Commission Order, or he is attempting to paint Alltel's position in an unfavorable light.

Q. Is there anything else about Mr. Eklund's statement that is inaccurate?

A. Yes, Mr. Eklund states that "(t)he FCC requires only that an allocation be reasonable, but does not direct an exact method of allocation." This is incorrect. FCC Rule §51.511 specifies the method for computing forward-

[13] [redacted] *See* Table 3, Eklund Testimony in response to Commission's Decision.

looking economic costs per unit. The method effectively specifies how network element costs (*e.g.*, transport costs) are to be allocated among users of network elements. It requires that network element costs be "divided by a reasonable projection of the sum of 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." The term, reasonable, is used as an adjective to describe the projection of demand and the period over which demand is projected. However, the basis for the allocation of network element costs is the measure of demand for the network element. The path method originally proposed by the RLECs, and apparently still favored by them, is not a proper measure of demand or cost causation. Mr. Eklund's characterization of the FCC rule is inaccurate and inappropriately implies that network element costs can be allocated on any basis as long as someone views it to be "reasonable."

Q. Do you agree with the changes made in the cost study re-runs to implement the Commission's Order for redistributing transport costs between special circuits and switched circuits?

A. No, the changes are incorrect. There are three fundamental errors. First, the ratios of DS-1-to-DS-0 special circuit rates and DS-3-to-DS-0 special circuit rates are invalid for equating DS-1 and DS-3 special circuits to switched circuits or voice trunks. They may be valid for equating DS-1 and DS-3

special circuits to DS-0 special circuits, but not voice trunks. The cost of a DS-0 special circuit is greater than the cost of a voice trunk, because it is provisioned differently.

The distinction here is critical, so let me explain it in a different way. McCook has developed a ratio indicating that a DS-1 special circuit has the rate equivalent of [redacted] DS-0 special circuits. That means that the rate, and presumably the underlying cost, of a DS-1 special circuit is [redacted] times that of a DS-0 special circuit, and in counting demand for DS-1 special circuits, each circuit would be equated to [redacted] DS-0 special circuits. However, a switched circuit or voice trunk is provisioned differently than a DS-0 special circuit. Different transport electronics and switch trunk equipment is involved. Different provisioning and other activities are involved. A DS-0 special circuit costs substantially more than a voice trunk. Therefore, a DS-1 special circuit cannot be equated to [redacted] voice trunks. I will explain later in my testimony how special circuit demand should be equated to voice trunks on a rate or cost equivalent basis consistent with the Commission's Order.

Second, transit circuits are still being improperly counted as "paths" as in the original cost studies; *i.e.,* the ratios of special circuit rates are not multiplied times the quantities of transit circuits. This is a significant, "clerical" error in the cost study re-runs.

Third, the new projected demand for transport is incorrect. The forecast period is limited to one or two years, which is a small portion of the life of transport electronics. Consequently, the forecast omits future demand for broadband services and demand that supposedly justifies the OC-192 transport systems included in the cost studies. Transit circuit demand also has not been forecast, but instead remains at levels from 2006.

As a result of these errors, the transport costs or rates produced in Table 13 of Mr. Eklund's testimony, ranging from [redacted] to [redacted] per minute, are substantially overstated. The transport electronics and transport outside plant cost calculations must be again revised.

Q. What direction did the Commission's Order provide for the redistribution of transport costs?

A. The Commission in paragraph 25 of the Order required each RLEC to "revise and refile its cost study to reflect a rate equivalency method as the basis for the assignment of transport costs."

Q. How did the RLECs make the required cost study revision?

A. I'll use McCook to illustrate the RLEC revision. In its revised cost study, McCook attributes [redacted] percent of transport costs to switched circuits or voice trunks and the remaining [redacted] percent to special circuits. The overwhelming majority of the cost burden for transport is being placed on voice traffic.

Q. Does it make sense that over [redacted] percent of future transport costs are caused by voice traffic?

A. Absolutely not. Based on Table 8 in Mr. Eklund's testimony, the quantity of voice trunks from 2006 to 2010 are estimated to [redacted] percent.[14] While Mr. Eklund increases voice trunks, transport minutes of use are forecast to [redacted] percent.[15] At the same time, overall special circuit demand [redacted].[16] Keep in mind the forecast is for 2010 – one or two years into the ten year life of transport electronics equipment. McCook is slicing the "cost pie" based on demand in the second year of the life of transport electronics knowing that switched traffic is declining and special circuit demand is rising. On top of this error, McCook's cost study reflects a pie significantly larger and more costly (an OC-192 transport system) than the RLEC's forecasted demand requires.[17] These are gross violations of the requirements of FCC Rule §51.511 to allocate costs based on a projection of demand over a reasonable measuring period and FCC Rule §51.505(b)(1) to measure costs reflecting efficient network configuration. It is imperative for the Commission to require that these errors be corrected.

[14] [redacted]

[15] [redacted]

[16] [redacted]

[17] Transport electronics for McCook's OC-192 transport system costs [redacted] per year. A smaller OC-48 transport system would serve McCook's forecast demand at [redacted] percent less cost. [redacted]

Q. How is the [redacted] percent of total transport costs attributable to switched circuits calculated?

A. The [redacted] percent figure is calculated by dividing [redacted] McCook voice trunks projected for 2010 by the sum of the [redacted] voice trunks, [redacted] McCook special circuits expressed as rate equivalent DS-0 special circuits and [redacted] Alliance transit circuits.[18]

[redacted]

The quantity of [redacted] McCook DS-0 rate equivalent special circuits is based upon the forecast for 2010 of special circuits by bandwidth – DS-0, DS-1 and DS-3 – and the "rate equivalent" of each. Based on Table 4 of Mr. Eklund's testimony for McCook, a DS-3 special circuit has the rate equivalent of [redacted] DS-0 special circuits, and a DS-1 special circuit has the rate equivalent of [redacted] DS-0 special circuits.

[redacted]

Note that the quantity of [redacted] Alliance transit circuits is simply the sum of [redacted] DS-1 special circuits and [redacted] DS-3 special circuits. It is important to note that transit circuit demand is not based on a forecast, and no rate equivalence

[18] Quantities are from McCook's FLEC Model using input data from "Run 16."

adjustment has been made. Therefore, McCook did not adjust transit circuit demand as required by the Commission's Order.

Q. You indicated there were three errors in the calculation of the [redacted] Please describe the first error.

A. The ratios of DS-1-to-DS-0 special circuit rates and DS-3-to-DS-0 special circuit rates are invalid for equating DS-1 and DS-3 special circuits to switched circuits or voice trunks. In the calculation above, when the quantity of [redacted] DS-1 special circuits is multiplied times the ratio of [redacted] the result is approximately [redacted] rate equivalent DS-0 special circuits. According to Mr. Eklund the rate equivalents are based on "Qwest SGAT" rates, which are rates for unbundled dedicated interoffice transport. Assuming these rates reflect costs, this means [redacted] DS-1 special circuits cost the equivalent of [redacted] DS-0 special circuits.

However, a DS-0 special circuit costs more than a voice trunk. [redacted] DS-1 special circuits do not have the same costs as [redacted] voice trunks. [redacted] DS-1 special circuits have the costs of many more than [redacted] voice trunks. By not reflecting this in the calculations, the revised cost studies underestimate demand for special circuits and overestimate demand for voice trunks, causing costs to be misallocated to voice trunks.

Q. Why do DS-0 special circuits cost more than voice trunks?

A. While both DS-0 special circuits and voice trunks represent approximately the same bandwidth – 64 kilobits per second, they are provisioned quite differently resulting in different costs. A DS-0 special circuit typically is a voice grade, dedicated private line or Digital Data Service (DDS) dedicated circuit. DS-0 special circuits do not pass through the switch. Instead, they are connected to the interoffice transport system, after circuit conditioning and multiplexing from DS-0 to DS-1 level or higher.[19] This additional circuit conditioning and multiplexing requires additional transport electronics equipment – and more cost. According to Mr. Eklund's reply testimony, DS-0 special circuits also involve the same levels of provisioning activities and costs as DS-1 or DS-3 special circuits – again, causing more cost.[20] On the other hand, interoffice voice traffic is directed by the switch to voice trunks, which are combined to DS-1 level by the switch. The DS-1 circuits carrying voice trunks are connected to DS-1 ports (tributary interfaces) on the transport system, without the need for circuit conditioning or multiplexing from DS-0 to DS-1 level. In addition, a voice trunk would not require the provisioning

---

[19] See http://www.qwest.com/techpub/77389/77389.pdf, Qwest Technical Publication 77389, Section 6, "DS0 Unbundled Dedicated Interoffice Transport," issued January, 2005. Figure 6-1 illustrates a DS-0 level UDIT, showing the D-Bank with Channel Unit provided by Qwest used to multiplex the DS-0 circuit to DS-1 level for transport over Qwest's interoffice transport system. A D-type channel bank is defined as follows:

> A D type channel bank is channel termination equipment used for combining (multiplexing) individual analog channel signals on a time division basis. D type channel banks provide interfaces for "n" analog signal inputs. Each analog input signal is directed to a codec for encoding to PCM samples. A part of a T1 carrier system.

(Source: http://www.carrieraccessbilling.com/telecommunications-glossary-d.asp)

[20] *See* "Rebuttal Testimony of Tim Eklund on Behalf of the South Dakota RLECs," p. 18. Mr. Eklund stated, "Further, DS1 and DS3 services incur the same provisioning, maintenance and testing costs as does on DS0."

activities of a DS-0 special circuit. Without the requirement for additional transport electronics equipment and provisioning activities there is less costs. Thus, DS-0 special circuits have higher costs than voice trunks. And, this means that the ratio of DS-1-to-DS0 special circuit rates ([redacted] for McCook) is not representative of the relationship between the cost of a DS-1 circuit and a voice trunk.

Q. The RLECs argued that DS-1 circuit does not cost 24 times a DS-0 circuit. Does your explanation help clarify this issue?

A. Yes, earlier I quoted paragraph 25 of the Commission's Order, where it noted, "McCook opposed the DS-1 equivalent method asserting that under the rationale of a DS-1 equivalent method, the rate for a DS-1 would be 24 times higher than the rate of a DS-0." I understand that the rate for a DS-1 special circuit is [redacted] times the rate for a DS-0 special circuit (for McCook), not 24 times higher. However, the cost for a single voice trunk is $1/24^{th}$ of the cost of a DS-1 transport circuit carrying voice trunks on the transport side of the switch. Or, to say this more accurately, a voice trunk consumes $1/24^{th}$ the capacity of a DS-1 transport circuit and, therefore, causes $1/24^{th}$ the cost of a DS-1 transport circuit. To equate one DS-1 special circuit to [redacted] voice trunks is a serious error, one of which the Commission must take notice.

Q. Can you further explain the fallacy of using special circuit rate equivalents to put special circuit demand on a basis comparable to voice trunks?

A. Let me describe a scenario in which the special circuit rate equivalents might be used; however, it should be apparent that this scenario is not used by the RLECs and would be inefficient. Interoffice voice traffic is transported via voice trunks carried by a DS-1 circuit, and the DS-1 circuit along with other circuits is carried over the interoffice transport system.[21] When the DS-1 circuit arrives at a central office, it is dropped from the transport system and connected to the switch's trunk equipment at DS-1 level. The switch then connects incoming voice traffic carried on the voice trunks to end-user line equipment so that calls can be completed.

Consider an alternative scenario. When the DS-1 circuit arrives at an end office, it is dropped from the transport system. Rather than connect the DS-1 circuit to the switch, it is connected to a channel bank, where the DS-1 circuit is de-multiplexed to 24 DS-0 special circuits, each carrying a digital signal of 64 kilobits per second. The DS-0 special circuits are converted from digital to

[21] In "Responses to Alltel's Second Set of Interrogatories and Requests for Production of Documents" the RLECs were asked to "(a)dmit that interoffice DS0 voice trunks comprising the 'Switched' circuit quantity in Eklund Projected Demand Exhibits 7-10 are first multiplexed or combined by the switch to DS-1 level and then added to the interoffice transport system ... " After objecting to the request, the RLECs stated the following:

> Without waiving these objections, the SONET transport system assumed in the FLEC Engineering Model has no ability to interface or switch traffic at a DS-0 level. Any traffic that is added/dropped at a SONET terminal would interface at a DS-1 level, or greater. The individual voice trunks may be multiplexed to a DS-1 or greater signal by the switch or other ancillary equipment before they connect to the transport network.

analog transmission. Then, the DS-0 special circuits carrying analog voice traffic are connected to line equipment on the switch, and the switch connects the voice traffic to the called party's line equipment. Under this scenario, the transport electronics costs of a DS-0 special circuit and voice trunk are comparable. However, there is no need for switch trunk equipment, and the switch trunk cost [redacted] is no longer applicable. More fundamentally, the scenario necessary to justify use of special circuit rate equivalents to equate special circuit demand with voice trunk demand is simply unrealistic and inefficient.

Q. Can special circuit rate equivalents be used to correctly revise the cost studies?

A. Yes, I am not opposing the use of rate equivalents as directed by the Commission in its Order for special circuits. The ratios in Table 4 of Mr. Eklund's testimony can be used to compute quantities of special circuits on a rate equivalent basis. The ratios should not be used for voice trunks. The correct method for determining the portion of total transport costs attributable to voice trunks is as follows:

> % of total transport costs attributable to voice trunks = DS-1 circuits for voice trunks / (DS-1 circuits for voice trunks + Rate equivalent DS-1 circuits for special circuits)
>
> DS-1 circuits for voice trunks = Voice trunks / 24 voice trunks/DS-1 circuit
>
> Rate equivalent DS-1 circuits for special circuits = DS-0 special circuits / [redacted] DS-0/DS-1 + DS-1 special circuits + DS-3 special circuits X [redacted] DS-0/DS-3 / [redacted] DS-0/DS-1)

The rate equivalency ratios in the equations will vary by RLEC and be those shown in Table 4 of Mr. Eklund's testimony.

Q. What would be McCook's quantity of DS-1 circuits for voice trunks?

A. McCook has forecast [redacted] voice trunks for 2010. Dividing this quantity by 24 voice trunks per DS-1 circuit yields [redacted] DS-1 circuits for voice traffic or [redacted] DS-1 transport circuits when rounded to the next whole number. To confirm this calculation, let me provide a document from McCook that shows this is the method its uses to compute the quantity of DS-1 transport circuits.

The document on the following page was provided by McCook showing existing voice trunks and DS-1 transport circuits. It indicates [redacted] total voice trunks in service being served by [redacted] DS-1 transport circuits. This equates to [redacted] voice trunks per DS-1 transport circuit. Note that McCook's own document clearly indicates that [redacted] DS-1 transport circuits represents [redacted] "DS-0 Equivalents" (=[redacted]

(Confidential Table)

Q. What would be the quantity of rate equivalent DS-1 circuits for special circuits?

A. This quantity consists of two sources of demand – McCook's own special circuits and Alliance transit circuits. McCook has forecast for 2010 [redacted] DS-0 special circuits, [redacted] DS-1 special circuits and [redacted] DS-3 special circuit. Dividing these quantities by the appropriate rate equivalent yields the following measure of McCook's demand for special circuits:

[redacted]

Q. What would be the quantity of rate equivalent DS-1 circuits for Alliance transit?

A. In the original cost study, McCook indicated that it had [redacted] circuits for transiting by Alliance.[22] The circuits consisted of [redacted] DS-1 circuits for special access, [redacted] DS-1 circuits for switched traffic and [redacted] DS-3 circuits for conference bridge traffic. In both the original cost study and importantly in the cost study re-run, McCook counted transit circuits in terms of "paths." In the re-run, the transit circuits were not adjusted for rate equivalence as required by the Order. Following is the proper calculation for rate equivalent DS-1 circuits for Alliance transit:

[redacted]

[22] McCook FLEC:00057; note by Tim Wenande, Plant Manager, McCook Cooperative Telephone Co.

Q. Is there anything notable about McCook's treatment of transit circuits?

A. Yes, note that [redacted] of the [redacted] transit circuits are DS-1 circuits carrying switched traffic or voice trunks. These circuits are the same as McCook's DS-1 circuits carrying voice trunks. Yet, McCook's cost study does not count the voice trunks carried on Alliance's transit circuits, as it does its own. The cost study only counts [redacted] DS-1 circuits, each likely carrying 24 trunks. McCook's cost study is internally inconsistent. If it were consistent, it would divide McCook's [redacted] voice trunks by 24, yielding [redacted] DS-1 circuits versus Alliance's [redacted] DS-1 circuits for switched traffic. The reduction in the measure of transport demand by McCook's voice trunks relative to its own special circuits and Alliance transit circuits substantially redistributes costs away from voice trunks, as it should.

Q. Is there anything else of concern about McCook's quantification of transit circuits?

A. Yes, McCook's method produces a transport rate that would be discriminatory. All other things being the same, Alltel effectively would be charged a transport rate 24 times the rate that Alliance would pay for the same transport service.

Q. Based on these calculations, what is the correct percentage of transport costs to assign to voice trunks?

A. The correct percentage is no more than [redacted] percent (versus [redacted] percent McCook claims in the revised cost study). The calculation is:

[redacted]

Q. Why do you say the portion of total transport costs attributable to voice trunks should be no more than [redacted]?

A. The RLECs' transport demand forecasts are for two years of the ten year life of transport electronics – a ridiculously short forecasting period. McCook's estimate of future broadband circuits is limited to [redacted] DS-3. As demand grows for broadband services, such as DSL, video and others, transport system usage by special circuits will increase, lowering the percentage below [redacted] percent. In addition, McCook failed to even forecast transit circuits as required by the Order. If transit circuits grow from 2006 to 2010 at similar rates as McCook circuits, the forecast would show quantities of [redacted] DS-1 circuits and [redacted] DS-3 circuits.[23] The resulting percentage of total transport costs attributable to voice trunks would be [redacted] percent.[24]

Q. And, if McCook had forecast beyond one year, would this further reduce the [redacted]

[redacted]

23 [redacted]

24 [redacted]

A. Yes. As I will discuss shortly, McCook continues to reflect an OC-192 transport system in its cost study. As the Commission observed in paragraph 21 of its Order, "An OC-192 transport system is capable of handling over 5,000 DS-1 circuits." McCook has forecast capacity utilization of only [redacted] DS-1 circuits in its revised cost study. This represents just [redacted] percent capacity utilization – a trickle of interoffice traffic through the OC-192 system.[25] To justify this system, significant new demand for special/dedicated circuits of substantial bandwidth will have to occur after 2010. The percentage of transport costs attributable to voice traffic should further drop.

Q. Did Mr. Eklund provide any proof that the cost of a DS-0 special circuit is the same as the cost of a voice trunk, such that special circuit rate equivalents can be used to place special circuit demand on a comparable basis as voice trunk demand?

A. No.

Q. Did Mr. Weber, the RLEC's engineering witness, offer evidence proving that a DS-0 special circuit costs and voice trunks require the same plant and provisioning activities?

A. No.

[25] [redacted]

Q. Did Mr. Eklund provide any explanation for treating transit circuits differently from McCook's own circuits?

A. No.

Q. Did Mr. Eklund provide any proof of zero future growth in Alliance's transit circuits?

A. No.

Q. Do you consider these items of information necessary to prove that McCook's proposed rate does not exceed forward-looking economic costs?

A. Yes.

Q. Are McCook and the other RLECs obligated to produce this information?

A. Yes, FCC Rule §51.505(e)(2) requires it.

Q. Please summarize the corrections necessary to the cost study re-run by McCook and the other RLECs related to the distribution of transport costs between special circuits and switched circuits.

A. The following corrections are required:

1. A credible forecast of transport demand beyond 2010 must be produced. A forecast period of seven years is recommended. This represents 70

percent of the transport equipment life and is a period sufficiently long to reflect demand for future broadband services that supposedly warrant the OC-192 transport systems included in the cost studies.

2. Transit circuit demand should be forecast as required by the Order and not based on past in-service quantities and the "path" measure.
3. The quantity of voice trunks should be divided by 24 voice trunks per DS-1 transport circuit to compute switched circuit demand.
4. The quantity of DS-0 special circuits should be multiplied times the ratio of DS-0-to-DS-1 unbundled dedicated interoffice transport rates. For McCook, this ratio is [redacted]
5. The quantity of DS-3 special circuits should be multiplied times the ratio of DS-3-to-DS-1 unbundled dedicated interoffice transport rates. For McCook, this ratio is [redacted]
6. Assuming the new forecast reveals demand for OC-3 or higher bandwidth special circuits, the quantities of these should be multiplied times similarly computed rate equivalency ratios.
7. The percentage of total transport costs attributable to voice trunks for each RLEC should then be computed as illustrated above for McCook.

<u>Switch processor investments removed from cost studies are unsubstantiated.</u>

Q. Please describe the second change to the RLEC cost study required by the Commission's Order.

A. The second change was to remove switch processor investments for Centrex, CALEA and the Web-Self Care system.[26]

Q. What documentation or support was provided to substantiate the amounts of investments removed?

A. No support was provided to substantiate the investments removed. Mr. Eklund produced Table 6 in his testimony that showed total switching investment before and after removal of investments in Centrex, CALEA and the Web-Self Care system. Mr. Weber, the RLECs' engineering witness, produced what he labels, "CO Switch Detailed Estimates" as Exhibits NW-S-1 – NW-S-4 to his testimony; however, this information sheds no light whatsoever on the basis for the investment amounts removed. There is no information to verify the authenticity or accuracy of the amounts removed.

Q. What information should be produced for the record to substantiate the amounts of investment removed?

A. First, the separate amounts of investment in each of the three switching components should be provided so that their relative importance can be known. Second, source information for the Centrex, CALEA and Web Self-Care system investments should be provided to verify the authenticity and accuracy of the investment amounts. This source information may consist of switch cost estimates, vendor quotes or similar documentation, which

[26] *See* the Order, para. 18.

identifies the vendor, the date, the make-up of hardware and software, quantities, unit investments, *etc.* Third, the RLECs should reveal when the source information became available to them. This last item is particularly important. Previously, Alltel had requested in discovery details on the make-up of switch processor costs, including the three removed investment amounts, and was denied this information. If source information for the three removed investment amounts or other line items shown in Mr. Weber's Exhibits NW-S-1 – NW-S-4 was previously available, or is now available, this information is part of the RLECs' cost studies and should be part of the record per FCC Rule §51.505(e).

Q. Is the lack of proof for the Centrex, CALEA and Web Self-Care system investments removed from the cost studies indicative of the same lack of proof for switch processor investments in general?

A. Yes, I next address this issue.

Record to support switch processor investments remains insufficient for review.

Q. What details do Mr. Weber's Exhibits NW-S-1 – NW-S-4 provide for switch processor investment?

A. These exhibits provide a listing of the hardware and software components included in switch processor (referred to as "Common" in the exhibits). The quantities of each component are provided, as well as a single total amount of investment. Contrary to Mr. Weber's labeling of the exhibits they do not

provide "detailed estimates" of switch component costs. Alltel has raised this issue multiple times, and the RLECs have ignored it.

In the May 11, 2009 "Petitioners' Supplemental Responses to First Set of Interrogatories Made by Alltel," the RLECs responded to Data Request (DR) 11, which asked for them to identify the "(c)omposition of switch processor prices in terms of quantities and unit investments for hardware and software." (emphasis added) The RLECs response was as follows:

> See Exhibit G.2 produced with Petitioners' Supplemental Responses to Alltel's Discovery requests, which were served on Alltel on May 16, 2008. Additionally, see Exhibits NW-S-1 through NW-S-4 in Nathan Weber's supplemental testimony and Table 6 in Tim Eklund's supplemental testimony, both of which were served on Alltel on April 24, 2009. The attached exhibits represent the Petitioners' respective switching cost estimates which were revised pursuant to the Commission's January 27, 2009 oral ruling and February 27, 2009 Findings of Fact and Conclusions of Law. Pursuant to the Commission's ruling, the revised cost estimates exclude the costs associated with Web Self-Care, CALEA and Centrex.

None of these documents provide unit investments for switch processor components (items 1-22 of Exhibits NW-S-1 – NW-S-4). Alltel then asked in DR 12 the RLECs to provide sources of the unit investments, and they replied as follows:

> Petitioners' responses to this request have not changed from those discovery requests served on Alltel on February 29, 2008, and May 16, 2008. ... Details concerning unit descriptions, unit quantities, and category pricing can be found in Exhibits NW-S-1 through NW-S-4 in Nathan Weber's supplemental testimony and Table 6 in Tim Eklund's supplemental testimony, both of which were served on Alltel on April 24, 2009.

Again, the RLECs avoided providing unit investments for the 22 components of switch processor investment contained in the cost studies. Exhibits NW-S-1 – NW-S-4 provide only a total investment amount for all 22 switch processor components.

Q. Why has Alltel repeatedly sought details for switch processor investment?

A. Alltel sought the unit investments associated with each switch processor hardware and software component for two purposes – to understand the relative importance of each to the total switch processor investment and to have information that would permit corrections to the cost study. Alltel also sought information on the capacity of certain components to evaluate whether the component is likely to exhaust over its life due to usage, and this information has not been produced.

Now, after being directed to do so, the RLECs have somehow been able to remove specific amounts of investment for Centrex, CALEA and the Web Self-Care system. Had this information been revealed prior to the Order, Alltel might have evaluated the impact on the proposed rates of removing these investments. Furthermore, Alltel has raised issues about whether the costs of other switch processor components are recoverable in reciprocal compensation, such as costs of the call agents, media gateways, the Outboard Line Bay equipment and portions of spare equipment. Without the details that

now allow the RLECs to remove three switch processor components, Alltel has been denied information sufficient for review.

Q. Can you give a simple analogy to illustrate the importance of this issue?

A. Suppose I planned to paint a room in my house. I asked the local hardware store for a cost quote, and I received the following:

Cost Quote to Paint a Room

Component	Quantity	Unit Cost	Extended Cost	% of Total
Drop cloth	2	$ 5.00	$ 10.00	4%
Paint brush	2	$ 7.00	$ 14.00	6%
Cans of paint (5 gallon)	3	$ 50.00	$ 150.00	64%
Bag of fertilizer	4	$ 15.00	$ 60.00	26%
Total			$ 234.00	100%

This information would allow me to evaluate the reasonableness of the cost quote (Total) and to consider the relative importance of each component to the total cost (% of Total). I could ask that the four bags of fertilizer (as in Centrex, CALEA and Web Self-Care) be removed as they are not necessary to paint the room. I could make this correction myself. Seeing a unit cost of $50 per can of paint, I could see that this is for a five gallon can of paint, and the quote includes three cans. Based on the square feet of wallspace, I could ask for a correction for three one gallon cans of paint. After adjustments, the cost quote would reflect an "efficient configuration" of resources necessary to paint a room.

However, suppose that the hardware store refused to provide the unit cost information and information about the capacity of the paint cans. The quote would appear as follows:

Cost Quote to Paint a Room

Component	Quantity	Unit Cost	Extended Cost	% of Total
Drop cloth	2			
Paint brush	2			
Cans of paint	3			
Bag of fertilizer	4			
Total			$234	

This is the level of "detail" in Exhibits NW-S-1 – NW-S-4 provided to support the revised cost studies. I believe most consumers would find this information not "sufficient for purposes of review." They might be able to ask the hardware store to remove the bags of fertilizer. They would not know the relative importance of each component. They would be unaware of the excess paint that would remain after the room is painted. They would have no information on unit costs to compare with comparable prices elsewhere. This is precisely the position Alltel has been placed.

Q. Did Alltel make yet another attempt to obtain information about switch processor investments in the revised cost studies?

A. Yes, in Alltel's second set of interrogatories the RLECs were asked to identify documents and information used to determine the amount of investment to be removed from the cost studies for Centrex, CALEA and Web Self-Care. The RLECs were asked to identify whether information exists showing quantities, unit investments and supporting details for the switch investments in Exhibits

NW-S-1 – NW-S-4. The RLEC responses this time seemed somewhat more impatient, but they still refused to provide the requested information. Their response was as follows:

> Petitioners object to this Request to the extent that it seeks information which is confidential and proprietary and subject to Non-Disclosure Agreements between Vantage Point Solutions and the underlying vendors. Petitioners previously explained the existence of the NDAs which specifically prohibit disclosure of certain information. Petitioners previously provided that information which they were legally able to provide and Alltel did not object to the adequacy of that information at that time. Before providing this information, the undersigned discussed the disclosure of specific pricing information with counsel for the various vendors and was told in no uncertain terms that they would not agree to disclosure of any more detail than what was previously disclosed.
>
> Without waiving these objections, the pricing estimates utilized in the FLEC Engineering Model for the Switching network investments were based on competitive proposal pricing received on projects of similar size and scope to the Petitioner's network. The pricing reduction for removing the investments associated with Centrex, CALEA, and Web Self-Care were calculated by entering a quantity of zero for those respective items which eliminates the investment associated with those items.

Q. Do you agree that Alltel was satisfied with the adequacy of information previously provided?

A. No, otherwise Alltel would not have asked for the same information again and again.

Q. Does the RLEC response to Alltel's second set of interrogatories suggest that the RLECs have the requested information?

A. Yes. The fact that Centrex, CALEA and Web Self-Care investments were removed from switch processor investment by "entering a quantity of zero" suggests that the switch investment model contains quantities and unit investments, similar to my earlier analogy of the hardware store quote.

Q. Have the RLECs produced evidence to prove the validity of the switch processor investments in the revised cost study?

A. No. They have not revealed the unit investments of switch processor components and provided support for these unit investments.

Q. Are the RLECS required by FCC rules to provide such proof?

A. Yes, according to §51.505(e), the RLECs are required to provide this proof. This is just as the hardware store would be expected to show that the quote for materials to paint a room is reasonable.

Q. Given that the Commission Order accepted switch processor costs, other than Centrex, CALEA and the Web Self Care system, why is it appropriate for the RLECs to now provide details regarding switch processor component investments?

A. The Commission's Order did not require changes by the RLECs to their switched transport and total switched minutes of use. They chose to make these changes to their original cost studies. In doing so, the RLECs dramatically reduced switch usage and apparently made no change in switch

processor component investments and costs (for call servers, media gateways, *etc.*) other than the three items the Commission directed to be removed. This caused switch processor costs per minute to increase. McCook's switch processor cost in the original cost study including Centrex, CALEA and the Web Self Care system was [redacted] and, in the revised cost study, excluding the three items, switch processor cost is [redacted] This increase in costs results from a [redacted] percent reduction in switch usage and no apparent, corresponding change in switch processor investment and costs. Per FCC Rule §51.505(e), the RLECs are obligated to prove the validity of switch processor and other costs, in particular to demonstrate why switch processor investments and costs did not change in line with switch usage.

Q. What is your recommendation on this matter?

A. If the RLECs have further details on the basis for investments for switch processor components shown in Exhibits NW-S-1 – NW-S-4, they should be directed to provide this information to Alltel. Specifically, this information includes quantities, unit investments and relevant capacities for each component.[27] Alltel should be given the opportunity to analyze this

[27] Relevant capacity information refers to information about the limiting capacity of each switch processor component and the expected utilization of that capacity. Previously, the RLECs have indicated quantities of "Concurrent Call License(s);" however, relevant capacities vary by switch processor component. A call agent's capacity, for example, may be limited by busy hour call attempts and other measures of capacity. Media gateways, OLB processors, *etc.* may have different measures of capacity. This information will assist in understanding why switch processor investment and costs have not changed in line with switch usage between the original and revised RLEC cost studies.

information and submit supplemental testimony, which the Commission should use in directing the next re-runs of the RLEC cost studies.

New evidence supports Alltel's position that switch processor costs are non-usage sensitive.

Q. What was the Commission's finding with regard to the usage-sensitivity of switching costs?

A. The Commission addressed the issue of usage-sensitive switching in paragraphs 16 and 17 of the Order.

> 16. With respect to switching costs, two related issues raised by Alltel regarded what switch investment, by switch category and exchange, should be included in McCook's cost study and what percentage of the switch investment is usage sensitive and recoverable. Alltel Ex. 2 at 26-31. Alltel claimed that McCook had included switch investment and costs that are not usage sensitive and, therefore, not recoverable. Alltel claimed that the "getting started" costs of the switch are not usage sensitive because McCook's switches will not exceed capacity. *Id.* at 41-46. Alltel stated that the portions of switch investment that are usage sensitive are the trunk card investment per line. *Id.* at 45. In addition, Alltel stated that certain items should be excluded because the items are not necessary for the termination of a call and are therefore not usage sensitive. Alltel Ex. 3 at 9-12. McCook claimed that the costs are includable and usage sensitive because a switch is sized for usage and must be capable of future demand. Tr. At 88.
>
> 17. The Commission finds that, with the exception of a few costs attributable to certain components of the switch, the switch investment as set forth by McCook was properly included in its cost study. Alltel's claim that "getting started" costs of the switch should be excluded would have the effect of excluding a number of costs of the switch that are usage sensitive and properly recovered through reciprocal compensation rates. The Commission finds that switches are, of necessity, sized for usage and that the FCC rules specifically contemplate that switching costs may be recovered

through per minute usage charges. *See* 47 C.F.R. § 51.509. (Emphasis added.)

Q. What new evidence has McCook produced to support Alltel's position that switch processor investment and costs are non-usage sensitive?

A. McCook's original cost study contained [redacted] of switch processor investment. Again, this is the investment for items labeled "Common" in Exhibits NW-S-1 – NW-S-4. In the revised cost study, the investment is [redacted], with the difference being the investments in Centrex, CALEA and the Web Self-Care system. There does not appear to be any change in the remaining switch processor investment. (This can be confirmed, if the RLECs produce information on unit investments requested by Alltel.) Switch processor investment, therefore, remains constant.

The original cost study reflected switch usage of [redacted] annual total switched minutes of use (MOU) in 2006. In the revised cost study, switch usage is [redacted] annual minutes of use in 2010. If McCook's claim that "a switch is sized for usage and must be capable of future demand" is accurate the switch processor investment in the original cost study would have been sized for [redacted] annual MOU. In the revised cost study, switch processor investment would have been sized for [redacted] annual MOU. Note that usage has changed by a [redacted] percent at the beginning of the life of the switch, and there is no change in switch processor investment.

In addition, usage is not expected to increase. In Alltel's second set of interrogatories, the RLECs were asked to admit that demand for switched traffic in the future is assumed to decline in the cost study re-runs. They admitted this.[28] So, McCook has reduced its initial total switched minutes of use and forecasts future declining usage, with no change in switch processor investment. This new evidence indicates that switch processor investment and costs do not vary with usage.

Q. Does this evidence support other specific arguments Alltel has previously made?

A. Yes. In my Supplemental Direct Testimony filed on June 12, 2008, I stated the following in response to a question regarding specific switch processor or common components:

> Based on supplemental responses, the RLEC cost studies appear to reflect switching systems from Metaswitch, a company that designs and manufactures softswitches. In addition to the supplemental responses, I obtained information on switches from the Metaswitch website. The information in the "CO Switch Detailed Estimates" spreadsheet and the Metaswitch website indicates that several *common* switch components should not be included in termination-related investments and costs, and that others are questionable. (Refer to Exhibit Supplemental WCC-1, Description column.)
>
> • Call Agent (CA), CA Software, CALEA license and Centrex license. A pair of CAs is deployed in each exchange, or at each host and "non-host switch." The Metaswitch website indicates that the CA9024 Call Agent Server "supports up to 1.3 million busy

[28] "Responses to Alltel's Second Set of Interrogatories and Requests for Production of Documents," June 22, 2009. Alltel asked, "Admit that demand for switched traffic in the future is assumed to decline in the cost study re-runs." The RLECs' response was, "Admitted."

hour call attempts (BHCA) – sufficient for a network of up to 250,000 subscribers. Given that the largest number of subscribers in any RLEC exchange is [redacted] (Alliance Brandon), usage will not exhaust the CAs (or CA software). This means CA investments and costs are not usage-sensitive and recoverable in termination charges.

...

- 3510 Media Gateway (MG) Chassis, 2510 MG Chassis and MG software. RLEC host switches include the 3510 MG Chassis, and "non-host switches" include the 2510 MG Chassis. According to Metaswitch, the 3510 and 2510 MG Chasses can accommodate up to 28,224 and 2,304 concurrent calls, respectively. Given that the largest host and "non-host switches" have [redacted] lines (Alliance Brandon) and [redacted] lines (Alliance Crooks), respectively, it is extremely unlikely that the MG chasses are exhausted by usage. Therefore, their investments and costs are not usage-sensitive and recoverable in termination charges. This also applies to the associated MG software.

...

- Outboard Line Bay (OLB) Chassis, OLB Processor, and OLB Administration and Maintenance Processor. In their supplemental responses, the RLECs described the purpose of OLB equipment as follows:

> Due to the fact that packet switching platforms typically have no capability of providing on-board analog POTS line interfaces, it was necessary to include an Outboard Line Bay (OLB) platform to provide this functionality. In this example, the OLB resides in the central office and is functioning as an extension of the switch. The OLB shelves communicate with the packet switching platform via GR-303 links.

The RLECs correctly do not include the *line cards and line interfaces* installed in the OLB platform in termination, but do include the OLB chassis and processors. However, the OLB chassis and processor appear to be terminals for broadband loop carriers, similar to digital loop carrier systems. They are part of access or loop plant and should be excluded from termination, just as a digital loop carrier system would not be included in termination provided in a traditional TDM switch architecture.

...

> Depending on the proportion of total investment represented by each component, it appears that little, if any, of the investment and associated annual costs included in the switch *common* category are usage-sensitive or attributable to terminating mobile-to-land traffic.
>
> (Footnotes omitted.)

The fact that McCook has lowered its total switched minutes of use by [redacted] percent with no apparent change in call agent, media gateway or OLB investment should be a "red flag" that the costs of these switch components are non-usage sensitive, with respect to switched voice traffic. In addition, with declining demand for switched minutes of use, switched voice traffic will not contribute to exhaustion of switch processor components and therefore cause costs.

Q. What is your recommendation with regard this new evidence?

A. I recognize that the Commission dealt with the issue of the usage-sensitivity of switch processor investment and costs in its Order. I believe, though, that the new evidence produced by the RLECs warrants consideration. If the Commission agrees, I recommend that the RLECs disclose the investments for the 22 switch processor components shown in Mr. Weber's Exhibits NW-S-1 – NW-S-4 and describe how these investments were computed, specifically identifying the relationship between demand (annual switched minutes of use or other usage) and the investment amounts. This information will help to explain why switch processor investment and costs did not change as switch usage significantly changed.

New demand forecasts are unsubstantiated, improper and inaccurate.

Q. Please describe the third change made by the RLECs to the cost studies.

A. The RLECs revised their cost studies to forecast transport demand from 2008 to 2010. In the original cost studies transport demand was measured retrospectively as of 2006. The RLECs also substantially lowered their forecast switched transport and total switched minutes of use.

Q. What did the Commission Order require of the RLECs with respect to forecasting transport demand?

A. In paragraph 23 of its Order, the Commission stated the following:

> 23. The Commission finds that McCook has failed to show that the use of 2006 demand should be considered to be McCook's "forward-looking" demand. Although one of McCook's witnesses testified that 2006 demand is a proper projection of forward-looking demand, another McCook witness predicted that demand would increase in the future. In addition, the Commission notes that Alltel did not project forward-looking demand. Tr. At 445. Therefore, the Commission finds that the record does not contain a credible projection of forward-looking demand and the use of 2006 demand is inconsistent with the proposed use of an OC-192 network. The Commission finds that in order for the Commission to determine the appropriate reciprocal compensation rate, the record must be supplemented on this issue. The Commission directs McCook to file a new projection of forward-looking demand.

The Commission placed two requirements on the RLECs. First, they should develop a "credible projection of forward-looking demand," and second, such projection should not be "inconsistent with the proposed use of an OC-192 network." In other words, it was not enough to merely project demand. The

projection had to be credible, and the cost study assumption of an OC-192 transport system had to be justified by the projected demand. The RLECs have failed to meet either of these two requirements.

Q. How did McCook forecast its forward-looking transport demand, and why do you consider it to be unsupported?

A. McCook and the other RLECs produced no documentation to support the transport demand forecasts other than Table 8 of Mr. Eklund's testimony. From analyzing the table, it appears the McCook forecast was prepared as follows:

- McCook had [redacted] switched circuits in 2006 and [redacted] switched circuits in 2008. This is a [redacted] percent increase over the two year period. It projected switched circuits to 2010 assuming the same [redacted] percent increase from 2008, resulting in a quantity of [redacted] switched circuits. Without explanation, this figure was reduced to [redacted] switched circuits. At the same time, McCook has forecast a reduction in switched transport minutes of [redacted] percent (from [redacted] to [redacted] annual minutes). No explanation was given for the need to maintain trunk capacity as demand declines.
- McCook experienced an [redacted] percent decline in DS-0 special circuits from 2006 to 2008 and assumed the same reduction through 2010. DS-1 special circuits increased [redacted] percent from 2006 to 2008, and the same growth rate was assumed through 2010.

- McCook had [redacted] DS-3 special circuit in 2006 and assumed it would have [redacted] DS-3 special circuits by 2010. No explanation was given.
- McCook did not forecast Alliance transit circuits. Transit circuits were left at the 2006 quantities.
- Dramatic changes were made in switched transport and total switched minutes of use. Access minutes were [redacted] from 2006 to 2010 by [redacted] percent. Extended Area Service minutes were [redacted] over the same period by [redacted] percent. And local and Internet minutes were [redacted] No explanation was given as to whether the forecast was based on changes in expected lines in service, rate plans, competitive losses or other. Total switched minutes from 2006 to 2010 were reduced by [redacted] percent from [redacted] to [redacted] annual minutes.

Q. Why are the transport demand forecasts improper?

A. Transport demand forecasts have several purposes in a forward-looking economic cost study. They are used to determine the type of transport technology and capacity necessary to efficiently serve demand (*e.g.*, an OC-192 transport system versus a smaller system). They are used to allocate transport costs between special circuits and switched circuits. And, they are used to compute forward-looking costs per unit of demand. To serve these purposes, the forecast must be credible and cover a "reasonable measuring period" as required by FCC Rule §51.511. The RLEC forecasts extend to

only 2010, which is a one or two year measuring period. Transport electronics plant has a [redacted] year life. Plant capacity and investment are sized to accommodate demand expected over the life of the plant. A demand forecast of one or two years does not reflect the future demand that causes plant investment and costs.

In addition, McCook's demand forecast shows that special circuit demand is [redacted] and switched transport minutes are [redacted] As this trend continues beyond 2010, the proportion of transport costs attributable to switched circuits will significantly [redacted] By limiting the demand forecast to 2010, the RLECs have produced the highest possible allocation of transport costs to switched circuits. Finally, incumbent local exchange carriers in general are expected to introduce new multimedia services that require broadband interoffice circuits. The demand forecasts do not reflect these services. For this and other reasons the RLEC demand forecasts lack credibility.

Q. Why are the demand forecasts inaccurate?

A. For McCook, Alliance's transit circuits have not been forecast. The quantities from 2006 are still being used. I have also described several factors that make the forecasts dubious; *e.g.*, the one-two year forecast period, the unsubstantiated [redacted] in minutes of use and the failure to reflect future broadband circuits.

Q. Do the demand forecasts satisfy the Commission's requirement to not be "inconsistent with the proposed use of an OC-192 network?"

A. No. McCook's new forecast calls for [redacted] voice trunks, which require [redacted] DS-1 transport circuits (= [redacted] / 24 voice trunks/DS-1). The equivalent of [redacted] DS-1 transport circuit is required for [redacted] DS-0 special circuits. [redacted] DS-1 special circuits are forecast for McCook, and [redacted] DS-1 circuits for Alliance transit. [redacted] DS-3 special circuit is forecast for McCook, and [redacted] DS-3 circuits for Alliance transit. These [redacted] DS-3 transport circuits have the capacity for [redacted] DS-1 circuits [redacted] All together that's demand for [redacted] DS-1 circuits [redacted] An OC-192 transport system has the capacity for 5,376 DS-1 circuits. Incredibly, McCook's forecast indicates [redacted] percent utilization of the OC-192 transport system.

An OC-192 transport system is not consistent with demand for [redacted] DS-1 circuits. The next smaller system size, an OC-48 transport system, has the capacity for 1,344 DS-1 circuits; an OC-12 transport system has the capacity for 336 DS-1 circuits. This means that to reach a "plateau" of demand to justify an OC-192 transport system, McCook will need to add another [redacted] DS-1 circuits of bandwidth between 2010 and the end of the life of the transport electronics. This scenario is either not credible in which case the cost study must be revised to reflect a lower cost transport system (OC-48 or OC-12), or the forecast period must be extended to reflect the demand causing

costs and to provide for a proper allocation of transport costs between special circuits and switched circuits. The RLECs simply have ignored the intent of the Commission's Order.

Q. Do the revised cost studies of the other RLECs show similar low utilization of OC-192 transport systems?

A. Yes, I will provide evidence of this as I describe the cost study corrections.

Q. Are the RLECs required to prove the validity of their demand forecasts?

A. Yes, the demand forecasts are key to the computation of forward-looking economic costs per minute of use; therefore, there can be no proof that cost study results comply with FCC Rules §§51.505 and 51.511 without validation of the forecasts.

Q. Have the RLECs provided adequate support to validate their demand forecasts?

A. No.

Q. Do FCC rules require demand forecasts to extend beyond two years?

A. FCC Rule §51.511 requires demand to be projected for a "reasonable measuring period" so as to produce forward-looking economic costs per unit of demand that reflect the demand that causes these costs, demand from the incumbent LEC's own services and those of other telecommunications

carriers. Importantly, it requires that unit costs reflect future demand as demand grows and unit costs decline. Given the facts in evidence – [redacted] switched transport demand, [redacted] special/dedicated demand, the introduction of multimedia services requiring greater bandwidth and the high capacity of OC-192 transport systems, two years is not a reasonable measuring period.

Q. What do you recommend to address these issues regarding the transport demand forecasts?

A. Several actions are required. First, McCook and the other RLECs must substantiate any significant [redacted]n switched transport and total switched minutes of use.[29] By [redacted] switched transport minutes and total switched minutes, McCook has offset the effects of cost study revisions directed by the Commission and increased the proposed rates. Second, the RLECs should extend the measuring period beyond 2010 to reflect future demand. I recommend a seven year measuring period, with demand "levelized" over this period for the purpose of computing forward-looking economic costs per unit. If the RLECs are unable or unwilling to forecast transport demand for seven years, then levelized demand should be calculated assuming that demand levels reach an OC-48 transport system's capacity by the end of life of transport electronics. Otherwise, an OC-192 transport system is not justified.

[redacted]

Third, transit circuit demand must be forecast for all RLECs. Fourth, the RLECs should include in their forecasts broadband circuits for multimedia services expected during the seven year forecast period.[30]

CORRECTIONS TO REVISED RLEC COST STUDIES

Q. Have you corrected the RLEC's revised cost studies to comply with the Commission's Order and FCC rules?

A. Yes. I have corrected the revised cost studies to address all but one of the issues that I have identified in the RLEC's cost study re-runs. I have not modified the annual switched transport minutes per voice trunk to reflect efficient utilization. Absent credible forecasts of transport demand, I have developed alternative forecasts of transport special and switched circuits and interoffice cable fibers, which result in more efficient utilization of transport electronics and outside plant. I will describe each of the corrections in detail.

Q. Please begin your description of the corrections.

A. The spreadsheet in Exhibit WCC-S-1 illustrates the cost calculations in the revised RLEC cost studies. All data contained in the spreadsheets are from the RLEC studies. I have not substituted any "outside" data in the calculations; *i.e.*, these are the RLEC's own "numbers." Costs per minute are shown for the four elements of transport and termination (rows 20, 33, 38 and

[30] McCook forecast [redacted] DS-3 special circuit for its own operations. Kennebec, Santel and West River forecast [redacted] DS-3 special circuit, respectively. None of the RLECs projected higher bandwidth circuits that likely will be necessary for DSL, video, *etc.*

46) and the total cost per minute is shown on row 48. The values on row 48 compare with those provided by Mr. Eklund in Table 13 of his testimony. Exhibit WCC-S-2 shows the same cost calculations with corrections. I have substituted corrected values on certain lines, as necessary.

Transport system size

Q. Have the RLECs produced any substantive information to prove that OC-192 transport systems represent efficient network configuration as required by FCC Rule §51.505(b)(1)?

A. No.

Q. Are the RLECs required by FCC rules to produce such proof?

A. Yes, per §51.505(e). The Commission also required consistency in forecasts of transport demand and transport system size. (Order, para. 23.)

Q. What corrections were made to transport electronics costs?

A. The size of the transport system for each RLEC has been reduced from an OC-192 system to an OC-48 transport system. This reduces the total annual costs of base and line equipment on row 8 of Exhibit WCC-S-2 by the amounts shown on line 9.

Q. What evidence supports reducing the size of the transport system?

A. The RLECs forecast voice trunks and special circuits as of 2010. The following table expresses these forecasts in terms of transport bandwidth in DS-1 circuits. For example, McCook forecast [redacted] voice trunks, [redacted] DS-0 special circuits, [redacted] DS-1 special circuits and [redacted] DS-3 special circuit. In addition, transit circuits consisting of [redacted] DS-1 circuits and [redacted] DS-3 circuits were included by McCook. In total, this represents bandwidth of [redacted] DS-1 circuits.[31] Values for bandwidth for the other RLECs transport demand were computed similarly.

	A	B	C	D	E
58	**Transport System Utilization**	McCook	Kennebec	Santel	West River
59	Forecast DS-1s in service (2010)	[redacted]	[redacted]	[redacted]	[redacted]
60	Utilization of transport system capacity	[redacted]	[redacted]	[redacted]	[redacted]
61					
62					
63					

The original and revised RLEC cost studies assumed OC-192 transport systems with nominal capacity equivalent to 5,376 DS-1 circuits. The table shows that capacity utilization reflected in the revised cost studies is quite low.[32]

Q. What is the practical implication of this evidence?

[31] [redacted]

[32] Kennebec's quantity of [redacted] DS-1s in service is based on [redacted] In addition, Kennebec's revised cost study includes [redacted] transit circuits. Alltel requested the bandwidth of these circuits; however, Kennebec was not able to provide this information prior to the filing of testimony. Depending on the bandwidth of these transit circuits, the quantity of DS-1s in service is greater than [redacted] resulting in higher utilization of the transport system for Kennebec. The quantities of DS-1s in service for the other RLECs includes transit circuits, as appropriate.

A. It means that the cost of [redacted] percent or more spare capacity for an OC-192 transport system is being borne by the expected demand next year, in 2010. It results in transport electronics costs per minute well in excess of the total element long-run incremental cost (TELRIC) of transport electronics, and it inflates the reciprocal compensation rate.

Q. In continuing to reflect OC-192 transport systems are the revised cost studies consistent with the Commission's Order?

A. The Commission Order required the RLECs to file a new transport demand forecast consistent with requirements for an OC-192 transport system (Order, para. 23). The RLECs have not done this. In fact, nowhere in the testimony do the RLECs even attempt to justify the OC-192 transport system. Rather, they simply use the OC-192 system again without explanation. To return with demand forecasts representing a small fraction of transport system capacity fails to demonstrate that the cost studies reflect the lowest cost configuration of transport electronics and fails to comply with the Commission's Order.

Q. Might the RLECs argue that an OC-192 transport system is required to serve future demand?

A. If such an argument was going to be made, it should have been made, and demonstrated, when the RLEC witnesses originally filed testimony. If such an argument is made, the RLECs should produce credible forecasts beyond 2010 to prove it, and Alltel should be permitted a chance to respond to it. In

addition, forward-looking economic costs per unit must be calculated based on the greater demand in the future to avoid burdening the reciprocal compensation rate with costs caused by future demand. FCC Rule §51.511 requires this.

Q. How was an OC-48 transport system selected to correct the cost studies?

A. The table above shows that 2010 transport demand results in utilization of an OC-48 system ranging from [redacted] percent. Utilization for a smaller OC-12 system would be [redacted] percent. The OC-48 system size was selected to allow for future growth in transport, as the OC-12 system appeared too small for McCook and possibly small for others.

Q. Please describe the basis for the annual costs removed on row nine of Exhibit WCC-S-2.

A. The amounts of annual costs removed from base and line equipment costs are calculated using the RLEC's own cost data. OC-192 line equipment has an investment of [redacted] per exchange. This is for two OC-192 optical interface cards. The OC-48 line equipment has an investment of [redacted], for two OC-48 optical interface cards. This is a difference in investment of [redacted] per exchange. This amount was multiplied times the number of exchanges or locations with optical interface cards, and the associated annual costs were calculated to arrive at the amount to remove from the cost study. The amount removed from the McCook cost study in cell B9 was computed as follows:

[redacted]

Q. Are these corrections reasonable?

A. Yes. The corrections reflect a transport system (OC-48) with [redacted] percent spare capacity in 2010 based on the RLECs' forecasts. So, there is ample capacity for future growth. Annual cost amounts removed from the cost study are based on the RLEC cost data.

Percentage of transport electronics costs attributable to voice trunks

Q. What is the next correction to transport electronics costs?

A. The percentages of total transport electronics costs distributed between special circuits and switched circuits were corrected. As shown in Exhibit WCC-S-1, the percentages of base and line equipment costs distributed to voice trunks range from [redacted] percent for three RLECs, and [redacted] percent for Kennebec. The percentages for tributary equipment, which exclude demand for transit circuits, range from [redacted] percent. These percentages are based on the method discussed previously in which special circuit rate equivalents are improperly used to equate special circuit demand with switched circuit demand. I have used the correct method that I described to develop percentages for distributing transport electronics costs. In addition, I have projected the RLECs' transport demand beyond 2010. The table shown on the following page shows the calculations used to compute the percentages on rows 13 and 14 of Exhibit WCC-S-2.

Confidential Table

I will describe the corrections for McCook as an example. The corrected percentage of McCook transport electronics costs for base and line equipment attributable to switched circuits is [redacted] percent compared to [redacted] percent in the cost study re-run. This value is computed by dividing [redacted] DS-1 switched transport circuits by [redacted] total DS-1 circuits and rate equivalents. These values are computed as follows:

[redacted]

The quantity of [redacted] DS-1 special circuits is the sum of [redacted] McCook DS-1 special circuits and [redacted] Alliance DS-1 transit circuits. The [redacted] DS-3 special circuits is the sum of [redacted] McCook DS-3 special circuit, [redacted] Alliance DS-3 transit circuits and a new value for [redacted] additional DS-3 circuits estimated beyond 2010.

Q. Please explain the additional DS-3 circuits estimated beyond 2010.

A. In revising their cost studies, the RLECs have not produced credible transport demand forecasts. The demand projections are limited to 2010 and results in minimal utilization of an OC-192 transport system. To comply with the Commission Order and FCC Rule §51.511 demand must be projected for a

reasonable measuring period. The additional DS-3 circuits represent the growth in demand, levelized over a seven year measuring period, necessary to utilize an OC-48 transport system.

Q. On what basis did you select seven years as a measuring period?

A. Transport electronics have a [redacted] year life. Since transport electronics capacity is sized to serve future demand over the [redacted] year life, investment and costs are caused by demand over that period. Unlike a measuring period limited to 2010, a seven year period reflects demand causing transport electronics costs over much the plant life. It provides a window for reflecting growth in services requiring broadband transport, which the demand forecasts in the revised cost studies do not reflect. It allows for growth in plant utilization to provide for absorption of spare capacity costs. As described earlier, the revised cost studies place extraordinary cost burdens for spare capacity on near term demand. And, it yields forward-looking economic costs per unit of demand that are "levelized" over a reasonable portion of the plant life – not too long to risk cost recovery, but long enough to avoid excessively high short-run costs.

Q. Would it be reasonable to use a shorter planning period?

A. A concern with a shorter planning period is that the RLECs justify their large transport systems on future growth, much of which is expected to occur beyond the next few years. To properly associate costs with the demand

causing the costs, the measuring period must be sufficient to capture this growth. I would not recommend a measuring period of less than five years.

Q. How were the additional DS-3 circuit amounts calculated?

A. The table below shows the calculations used to compute levelized transport demand over the seven year planning period and the additional DS-3 circuit growth required for achieving this demand. The RLEC cost studies have been corrected to reflect OC-48 transport systems. The assumption is made that by the end of the ten year life of transport electronics each RLEC will have reached 85 percent utilization of the OC-48 system's capacity of 1,344 DS-1 circuits (= 48 DS-3s X 28 DS-1s/DS-3).

The RLECs have asserted that they require OC-192 transport systems, so an assumption of 85 percent utilization of an OC-48 transport system is not unreasonable. This represents only 21 percent utilization of the system the RLECs say they require due to future demand.[33] It seems reasonable to assume that each RLEC expects to have reached at least 1,142 DS-1 circuits of bandwidth in service by the end of ten years.

The RLECs have forecast the DS-1 circuit bandwidth they expect for 2010. Using McCook as the example, its demand can be expected to grow from [redacted] DS-1s at the end of next year to 1,142 DS-1s in ten years. Average growth

[33] 21% = (85% X 1,344 DS-1s/OC-48 system) / 5,376 DS-1s/OC-192 system.

per year is [redacted] DS-1s. Assuming [redacted] additional DS-1s per year, the table determines DS-1s in service at the end of each year for seven years, such that McCook's demand has reached [redacted] DS1s after seven years. Note this is [redacted] percent utilization of the OC-48 system and only [redacted] percent utilization of the OC-192 system McCook says it requires.

In the next step, annual demand is weighted by present worth factors to reflect the time value of money. An [redacted] percent discount rate is used from the RLEC cost studies. The sum of the present worth values of demand is then multiplied times an annuity factor for seven years. This produces a levelized demand value of [redacted] DS-1s over the seven year measuring period.

Confidential Table

Q. Why is a levelized demand value being calculated?

A. This is a technique used to compute costs per unit of demand that reflect the time value of money. Demand in the early years is given more weight than demand in the later years. For example, McCook's lower demand in 2010 of [redacted] DS-1s is weighted by a factor of [redacted]; whereas demand in the seventh year of [redacted] DS-1s is weighted by a factor of [redacted]. The method also takes into consideration the risks of forecasting demand over time, as demand in the seventh year carries about half the weight of demand in the first year [redacted]

Q. What is the next step?

A. After the levelized demand in DS-1s over the seven year measuring period is determined, the RLEC's forecast demand as of 2010 is subtracted from this amount to compute the additional DS-1s of demand after 2010. For McCook this value is [redacted] additional DS-1s (= [redacted] Additional demand for the other RLECs ranges from [redacted] DS-1s.[34]

[34] Kennebec's levelized demand must be recalculated after Kennebec provides the breakdown of its [redacted] transit circuits by bandwidth. The DS1s in service @ 2010 will increase from [redacted] to a higher figure. The DS1s in service @ end of service life will remain at 1,142 assuming an OC-48 transport system. After subsequent changes to the calculations, Kennebec's levelized demand is expected to be higher than [redacted] DS1s, resulting in lower transport costs per minute.

Q. Why is the additional demand for bandwidth expressed in DS-3s, rather than leaving it in terms of DS-1s?

A. This is done for two reasons. First, measuring the additional demand in DS-3s provides a more conservative estimate of the rate equivalent DS-1s to be added to the forecast. If left at the DS-1 level, the additional demand for McCook represents [redacted] DS-1s. By converting the [redacted] DS-1s to [redacted] DS-3s [redacted] and then multiplying by a [redacted] DS-1-to-DS-3 rate equivalent, the rate equivalents added to McCook's forecast is [redacted] DS-1 rate equivalent special circuits. Second, additional demand beyond 2010 is likely to be in broadband services, and DS-3 circuits are more representative of future broadband demand than DS-1 circuits.

Q. After computing the additional DS-3 circuits to reach levelized demand over seven years, how were these values used in the calculations?

A. The additional DS-3 circuits were added to each RLECs DS-3 special circuit demand used to compute the percentage of transport electronics costs distributed to switched circuits.

Q. Is the addition of DS-3 circuits for future growth consistent with the Commission's Order?

A. Yes. The Commission required new demand forecasts to be filed consistent with the size of the transport system used in the cost studies. The RLEC demand forecasts do not justify OC-192 transport systems, so OC-48 systems

have been substituted. The additional demand added to the RLECs' 2010 demand forecast are consistent with the level of growth that would justify OC-48 systems.

Q. If the RLECs maintain that OC-192 transport systems are necessary, what do you recommend?

A. In this case, the RLECs must develop new demand forecasts beyond 2010 that are consistent with requirements for OC-192 transport. I recommend a seven year measuring period and the calculation of levelized demand over this period. The RLECs should be required to fully document the forecasts and demonstrate the credibility of the forecasts.

Q. Are your calculations to correct the percentages of transport electronics costs attributed switched circuits the only ones in the record consistent with the Commission's Order?

A. Yes.

Annual switched transport minutes

Q. Have you changed the annual switched transport minutes in the revised cost studies, and if so, why?

A. The annual switched transport minutes have been returned to the original cost study values. These are shown on row 21 of Exhibit WCC-S-2. There are several reasons for this change. Voice trunk utilization (annual switched

transport minutes per trunk) were low and inefficient in the original cost study. Alltel raised this issue, and the Commission in its Order directed no changes to improve voice trunk utilization. In the revised cost studies, the RLECs have reduced trunk utilization by [redacted] percent, without any explanation. So, poor utilization has been made worse. In addition, while annual switched transport minutes have dropped, the RLECs maintained the number of voice trunks to serve the demand. Again, no explanation was given for maintaining trunk capacity while demand fell.

Q. Have the RLECs provided evidence to substantiate the new forecasts of switched transport minutes?

A. Two days before the filing of this testimony (July 1, 2009) I received additional information the RLECs produced related to their forecasts of switched minutes. This information was provided in response to Alltel's second set of data requests.[35] This information provided additional details on trends in switched transport and total switched minutes. I have been able to analyze the McCook information and found that it did not adequately substantiate McCook's forecasts. I will describe this information later in discussing corrections to termination costs.

Q. Have the RLECs provided evidence to demonstrate that voice trunk quantities in the cost studies represent efficient configuration?

[35] It appears the information was emailed to Alltel counsel the previous day.

A. No.

Q. Are the RLECs obligated to prove efficient configuration of voice trunk quantities in the cost studies?

A. Yes, per §51.505(b)(1).

Q. What do you recommend with respect to the new measures of switched transport minutes in the cost studies?

A. The RLECs should be required to project demand for switched transport minutes (as well as total switched minutes) beyond 2010. As with transport demand, these projections must be credible and supported by documentation to substantiate the forecasts. The Commission required consistency between transport demand and the size of the transport system. Likewise, the RLECs should be required to show consistency between switched transport minutes and voice trunk quantities.

In previous testimony, I recommended use of the benchmark of 108,000 annual minutes per trunk from §51.513 of the FCC rules. As the Commission has chosen not to use this benchmark, the RLECs should, therefore, produce measures of expected trunk utilization versus trunk capacity (*e.g.*, in busy hour CCS per trunk) to demonstrate efficient levels of trunk utilization.

Q. What are the results of the corrections to transport electronics costs?

A. As shown on row 20 of Exhibit WCC-S-2, corrected transport electronics costs range from [redacted] per minute. Any improvement in voice trunk utilization will further reduce these costs.

Percentage of interoffice cable costs attributable to transport system

Q. Did the Commission address the allocation of transport outside plant costs to voice traffic?

A. In paragraph 30 of the Order the Commission stated the following:

> The next issue regarding transport outside plant costs concerns the allocation of transport costs to voice traffic. Alltel Ex. 2 at 80. The Commission finds that its decision on this issue is the same as its decision regarding the calculation and apportion of demand for transport electronics.

The Commission's statement, in my view, means that a credible forecast of demand for outside plant or interoffice cable fibers is to be prepared, and the forecast is to be consistent with the size of interoffice cable (fibers per cable) in the cost study.

Q. Did the RLECs produce forecasts of interoffice cable demand to substantiate the interoffice cable size reflected in the cost studies?

A. No.

Q. What interoffice cable demand was used in the revised cost studies?

A. Past quantities of fibers in service for transport systems, special purposes and CATV were used. These were the same values as in the original cost studies.

Q. How does interoffice cable demand influence transport outside plant costs in the reciprocal compensation rate?

A. Row 26 of Exhibit WCC-S-1 shows percentages of total cable costs attributable to interoffice transport systems. These range from [redacted] percent, meaning that these percentages of total cable costs are assigned to the transport systems carrying mobile-to-land traffic. The percentages are based on the ratios of past fiber miles used by interoffice transport systems to total fiber miles used by interoffice transport systems, special purposes and CATV. The percentages are not forward-looking and do not reflect future demand for interoffice cable fibers. The RLECs are, in effect, implying there will be no additional demand for fibers in the future.

Q. Is this consistent with the assumed interoffice cable size in the cost studies?

A. No, the original and revised cost studies assume that all interoffice cables are [redacted]-fiber buried cables. The table below shows the maximum number of fibers in service by RLEC.

Confidential Table

The Kennebec and Santel cost studies reflect at most [redacted] fibers in service, leaving [redacted] "dark" fibers. McCook and West River have at most [redacted] and [redacted] fibers, respectively, in service in any section of interoffice cable. This low utilization of cable fibers results in high transport outside plant costs per minute.

Q. Have you corrected the cost studies?

A. Yes. Given the low quantities of fibers in service and the lack of a demand forecast by the RLECs, it is questionable whether [redacted] fiber cable is required. One alternative for correcting the cost studies is to reduce the cable size to [redacted] fiber cable, or smaller, consistent with fiber demand. This would lower the outside plant investment and costs, while leaving constant the distribution of costs between the transport system and other uses. RLEC information to compute investments and costs for reduced cable sizes are not available.

The alternative is to maintain the assumption of [redacted] fiber cable, but to increase demand. This is the approach that I have used. Future demand is assumed to reach [redacted] fibers or half the capacity of the [redacted] fiber cable. Certainly, if the RLECs assert that [redacted] fiber cables are required, it is reasonable to assume future demand of at least [redacted] fibers.

For McCook with [redacted] miles of interoffice cable this means demand will reach [redacted] fiber miles (= [redacted] fibers per cable X [redacted] miles of cable). Interoffice transport systems, based on McCook's costs study, will utilize [redacted] fiber miles. This represents [redacted] percent of total fiber miles in service. The remaining [redacted] percent of fiber miles are assumed to be for existing demand of [redacted] fiber miles for special purpose and CATV, plus [redacted] fiber miles used by others for future growth. Similar percentages are computed for the other three RLECs, and these values are substituted in row 28 of Exhibit WCC-S-2.

Q. Must the RLECs modify the allocation of transport outside plant costs?

A. Yes, the allocations in the revised cost studies fail to comply with the Commission Order and FCC Rules §§51.505(b)(1) and 51.511. [redacted] fiber cables are not justified by the demand in the revised cost studies, and the percentage of transport outside plant costs assigned to switch traffic does not reflect the future demand that supposedly justifies [redacted] fiber cables.

Q. Are the other corrections for transport outside plant similar to those for transport electronics?

A. Yes, the values on rows 29 and 34 of Exhibit WCC-S-2 are the same as those on rows 13 and 21.

Q. What are the values for corrected transport outside plant costs?

A. Corrected values shown on rows 35 range from [redacted] per minute. Low transport outside plant costs are to be expected when demand for OC-48 transport systems and [redacted] fiber interoffice cables are projected for a reasonable measuring period.

<u>**Usage-sensitive percentage of switch processor costs**</u>

Q. Have you prepared cost study corrections with and without switch processor costs?

A. Yes. The new evidence produced by the RLECs shows two essential facts. First, when initial total switched minutes are substantially [redacted] there is no change in switch processor investment and costs. Second, future total switched minutes are expected to [redacted] such that future usage will not place pressure on capacity or cause additional investment and costs. This evidence supports the finding that switch processor costs are not usage sensitive. Furthermore, the RLECs have produced no substantive evidence to prove otherwise. Their witnesses have merely testified that switches are sized based on usage, with no engineering evidence to support these assertions. For these

reasons, I have produced one set of corrections with the usage-sensitive percentage of switch processor costs changed to zero, resulting in switch processor costs of $0.0000 per minute.

Switch trunk investment and costs continue to be included in the cost study as usage-sensitive. However, the annual switched minutes on row 39 have been returned to the original cost study values, because the RLECs have failed to offer adequate proof or basis for the reductions in switched minutes of use. Switch trunk costs per minute in the corrected cost studies range from [redacted] per minute.

Q. Why do you consider the basis for the reductions in switched minutes to be inadequate?

A. As I indicated earlier, I received on July 1, 2009 information regarding trends in switched minutes. Given the limited time, I have analyzed McCook's information and prepared Exhibit WCC-S-3. The exhibit shows that in 2006, McCook had [redacted] total annual switched minutes. This is the quantity in the original cost study. The cost study also reflected [redacted] lines in service. The resulting annual switched minutes per line were [redacted] which is a reasonable amount of switch usage per line.[36]

36 [redacted]. For factors used, *see* Blake, V.A., Flynn, P.V., Jennings, F.B. AT&T Bell Laboratories, "A Study of AT&T's Competitors' Capacity to Absorb Rapid Demand Growth," June 20, 1990, p.10. Filed in CC Docket No. 90-132. "The typical residence generates about 3 to 5 CCS per station during the

In the revised cost study, McCook has lowered total annual switched minutes to [redacted]. The revised cost study continues to show [redacted] lines in service. This results in [redacted] annual switched minutes per line. This equates to only 2.3 BH CCS per line or well below a normal range.

Even if lines in service have decreased (and McCook has not revealed this), the changes in EAS and local minutes in Exhibit WCC-S-3 are dramatic. Local minutes, excluding terminating cellular minutes, dropped from almost [redacted] The forecast suggests that in the next two years, [redacted]. McCook provided no explanation for this, or the [redacted] It also is not certain that all switched traffic is included. For these reasons, the McCook cost study (and the other RLEC cost studies) were corrected using the original switched minutes that showed reasonable switch usage per access line [redacted]

CONCLUSIONS

Q. After all corrections, what are the RLEC forward-looking economic costs?

busy hour, and the typical business about twice that amount." The Irwin Handbook of Telecommunications Management, James Henry Green, McGraw-Hill Professional, Edition 3, 2001, p. 504.

A. Following is the table that I presented earlier during the summary of my testimony:

Transport and Termination Costs Per Minute

Company		Cost Study Re-runs	Corrected Cost Study Re-Runs w/o Removal of Switch Processor Costs	Corrected Cost Study Re-Runs w/ Removal of Switch Processor Costs
McCook	$			
Kennebec	$			
Santel	$			
West River	$			

When the RLEC cost studies are corrected for the errors in the calculation of transport costs and returning their switched minutes to original cost study values, their transport and termination costs range from [redacted] per minute. I believe that the substantial reduction in switch usage, with no change in switch processor costs, raises the question of whether these costs are usage-sensitive. When switch processor costs are removed, transport and termination costs range from [redacted] per minute. I understand the Commission decided the issue of usage-sensitive switching costs in its Order; however, given the significance of this issue to the rate, I ask that the new evidence revealed by the cost study revisions required by the Commission be considered.

Q. Does this conclude your testimony?

A. Yes, it does.

CONFIDENTIAL EXHIBITS