

- BEFORE THE UTAH PUBLIC SERVICE COMMISSION OF UTAH -

In the Matter of Petition of WWC Holding)	DOCKET NO. 03-2403-02
Co., Inc. for Arbitration of an)	
Interconnection Agreement)	DPU Exhibit No. 2
)	
)	

**DIRECT COST ANALYSIS TESTIMONY
OF
JONATHAN LEE**

**FOR THE
DIVISION OF PUBLIC UTILITIES
DEPARTMENT OF COMMERCE
STATE OF UTAH**

December 19, 2003

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I. INTRODUCTION

This Direct Cost Analysis Testimony describes additional work and analysis performed by Jonathan Lee with regards to the HAI 5.2a cost model and associated modifications. This direct testimony follows my Rebuttal Testimony filed on October 17, 2003. For the purpose of clarification, I will insert “Cost Analysis” in the title to refer to this and subsequent filings since the parties will be filing rebuttal testimonies again. I also recommend that for the purpose of this docket, the Commission use the HAI5.2a model with the Division’s modifications.

II. IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH THE DIVISION OF PUBLIC UTILITIES.

A. My name is Jonathan Lee. My business address is Heber M. Wells Building, 160 East 300 South, 4th Floor, Salt Lake City, Utah. I am employed as a Cost and Demand Analyst for the State of Utah in the Division of Public Utilities. I am testifying on behalf of the Division of Public Utilities.

Q. HAVE YOU PREVIOUSLY FILED TESTIFIED IN THIS PROCEEDING?

A. Yes. I filed Rebuttal Testimony on October 17, 2003. The Rebuttal Testimony addressed the cost models presented by the rural ILECs using the HAI 5.0a platform in their first Direct Testimony filing and the Division’s concerns with using an older version of the HAI

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1 cost model. In that filing, I recommended and filed the HAI 5.2a cost model platform.
2 That model platform was most recently used by the Utah Public Service Commission in
3 Docket 01-049-85: In the Matter of the Determination of the Cost of the Unbundled Loop
4 of Qwest Corporation, Inc.

5
6 **III. PURPOSE OF DIRECT TESTIMONY**

7
8 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT COST ANALYSIS TESTIMONY?**

9 A. The purpose of my Direct Cost Analysis Testimony is to describe the subsequent work and
10 analysis performed in evaluating the HAI 5.2a cost model since my Rebuttal Testimony
11 filing. Since the October 17th filing, the parties came to an agreement to use the HAI 5.2a
12 cost model platform for each of the Rural ILEC companies in this proceeding with a few
13 modifications. This Direct Cost Analysis Testimony explains these modifications, as well
14 as, supplies the input values used to generate the resultant rates for the respective Rural
15 ILEC companies.

16
17 **IV. WORK PERFORMED WITH THE COST MODELS**

18
19 **Q. BRIEFLY DISCUSS THE COST MODEL(S) SUBMITTED IN THIS DOCKET.**

20 A. The Rural ILECs initially submitted cost models for each of the companies involved in this
21 proceeding using the HAI5.0a cost model platform. Cost models were submitted for
22 Gunnison Telephone, Manti Telephone, South Central Telephone, Uintah Basin

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1 Telecommunications Association (UBTA) on a stand-alone basis, and for UBTA and
2 UBET Telecom on a combined basis (UBTA/UBET). Each of the companies had
3 modified the default inputs of the cost model on a company specific basis to reflect more
4 realistic values for their respective company. In addition, the rural-ILECs also modified
5 the distance files which the cost model uses in its calculations. However, during the initial
6 round of rebuttal testimonies and comments, the Division proposed that the parties use the
7 HAI 5.2a cost model platform with associated modifications. The Division felt that this
8 version of the cost model was most appropriate in light of the substantial effort and time
9 that went into analyzing it by the Division, Qwest, and CLECs during Docket 01-49-85.
10 Western Wireless proposed that the HAI 5.3a cost model platform be used. The 5.3a
11 model was filed in Oregon, California, and Washington after Utah's UNE docket
12 proceeding was already underway. The parties agreed to evaluate each version of the HAI
13 model and after some analysis, came to the agreement that all parties should use the HAI
14 5.2a platform with some modifications. The underlying basis of the various HAI cost
15 model versions are very similar; please refer back to my initial Rebuttal Testimony for a
16 description of the HAI cost model platforms.

17
18 **Q. WHAT ARE THE MODIFICATIONS TO THE HAI5.2a MODEL?**

19 A. In the Division's rebuttal filing, the HAI 5.2a cost model and modifications as a result of
20 the Qwest UNE docket were filed with the Commission. In addition to those previously
21 filed modifications, the Division had made additional modifications in three areas of the
22 HAI 5.2a model. First, in the Distance file that is used by the model in its calculation, the

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1 Division made changes from its initial rebuttal testimony filing. Second, with regards to
2 the Switching Module, the Division, in concurrence with the parties, incorporated some
3 algorithm calculations from the HAI 5.3a cost model. And third, for Manti Telephone
4 Company, the Division modified the number of lines, by category, to be more
5 representative of Manti Telephone Company's line counts.
6

7 **Q. WHAT ARE THE MODIFICATIONS MADE TO THE DISTANCE FILE?**

8 A. First, in the Division's Rebuttal Testimony filing, the Division modified the default HAI
9 5.2a distance file to reflect and incorporate the Rural ILECs' distances as represented by
10 GVNW in the HAI 5.0a model. In the Division's review of the modifications, the Division
11 noticed that Qwest's NECA code (505107) was not changed for the Vernal, Roosevelt, and
12 Duchesne wire centers which were acquired by UBET Telecom. Accordingly, the Division
13 has now modified the NECA code for the above three wire centers to 502999 to properly
14 reflect UBET's acquisition of the wire centers. Second, the Division changed the distance
15 for UBET as discussed below. These two changes are reflected in the UT_DISTANCE file
16 which is electronically filed as Attachment A. The file should be placed in the "Distance"
17 folder of the HAI 5.2a cost model.
18

19 **Q. BRIEFLY DISCUSS GVNW'S DISTANCES FOR THE COMPANIES.**

20 A. The Division requested additional information from GVNW as to how they modified the
21 distance file. GVNW provided the V(ertical) and H(orizontal) coordinates for each
22 company and its Tandem locations. Based on the information provided by GVNW and

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1 their representation of where each Rural ILECs' wire center connects to a Tandem switch,
2 the Division reviewed the distances for each wire center for each respective Rural ILEC
3 company. Based on the Division's investigation into how the V&H coordinates are used in
4 the distance calculation formula, to calculate the right angle distance from the wire center
5 to the tandem switch, the Division reaffirmed that the calculated distances were correctly
6 computed. In addition, the Division converted the V&H coordinates to Latitude and
7 Longitude coordinates and double checked the distances using an alternative methodology.
8 The results were within acceptable tolerances.

9
10 **Q. DID THE DIVISION CHANGE ANY DISTANCES FROM THE GVNW**
11 **DISTANCES?**

12 A. Yes. It came to the Division's attention that Western Wireless inter-connects with UBET at
13 Vernal, Utah. It is my understanding that Western Wireless then carries the traffic on its
14 own network from the Vernal interconnection point. In the default HAI 5.2a distance file,
15 the wire center distance is calculated to the tandem switch located at Flat Top Butte. It is
16 also my understanding that there is not a Tandem switch at Flat Top Butte, and therefore
17 the default distance should not be used. According to the above information, the Division
18 modified the distance for the UBET wire centers of Duchesne, Roosevelt, and Vernal to
19 reflect the actual distance, based on its latitude and longitude coordinates, to Vernal, Utah.
20 These changes are reflected in the Distance file in Attachment A.

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1 **Q. BRIEFLY DISCUSS WHY THE DIVISION USED GVNW'S DISTANCES (AS**
2 **MODIFIED FOR UBET).**

3 A. In rural areas, the geo-coding process is not as accurate as in more urban areas. In the
4 Qwest UNE docket, AT&T reported that the geo-coding process is overall 74% successful
5 for users in Qwest areas. However, in rural areas, the success rate (in Qwest areas) drops
6 substantially to approximately 60%, 54%, and 24% for density zones 100, 5, and 0
7 respectively. In rural areas, users tend to use P.O. boxes or can not be specifically geo-
8 coded into a cluster. These users, though they may live clustered together, are processed
9 using a placement algorithm which uniformly spreads out non-geocoded customers
10 throughout a cluster. As such, the distances needed to build plant to the users would be
11 systematically increased in the model. In addition, though using the right angle
12 methodology was a good solution to work around right-of-ways, lakes, and other natural or
13 man-made barriers problems, it tends to overstate distance in rural areas. These obstacles
14 would be more likely in urban areas than in rural areas. Using a right-angle calculation
15 where the shortest distance from point A to point B is the right angle connecting the two
16 points would have the impact of increasing the distance needed to serve the two points.
17 Thus, the overall distance (and the associated costs generated by the distance) in the model
18 would be systematically increased.

19
20 However, on the other hand, the HAI5.2a model uses updated customer number data and
21 places them into existing geo-coded clusters without creating new clusters. The Division
22 realizes that this anomaly of the model may have the opposite effect of not modeling

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1 “additional” facility needed to connect new clusters to the existing clusters. Thus, overall,
2 this would systematically decrease the modeled facility distance. Based on the available
3 information and data, I have left the distances based on GVNW’s representations of its
4 wire center and Tandem switch locations (for all but UBET’s wire centers) and feel that
5 doing so will negate any systematic over- or under- that the model introduces.

6
7 **Q. ARE THERE ANY OTHER DISTANCE FILE CHANGES?**

8 A. Yes. One other thing which was changed in the default distance file of the HAI 5.2a cost
9 model has to do with Special Line/Private Line. This will be discussed below in
10 conjunction with the Manti Telephone Company line count adjustment.

11
12 **Q. BRIEFLY DISCUSS MANTI TELPHONE COMPANY’S LINE COUNT.**

13 A. In the review of the HAI 5.2a model, it became evident that the HAI default line count
14 numbers for Manti Telephone Company was severely understated. The default HAI total
15 line count for Manti Telephone was 1,722, approximately 50% less than what the Division
16 believes is a reasonable number of lines for Manti Telephone Company. AT&T provided
17 the Division with a worksheet which scales up the lines based on a targeted number of lines
18 and recalculates the number of lines in each count category. The Division used the total
19 Manti line count number of 3,724 which was compiled by AT&T from available public
20 data as reported by the company. This number is comparable to the actual line count
21 number of 3,473 shown for Manti Telephone on the Rural Telecom Association publication
22 printed earlier in 2003. The AT&T worksheet, however, also reported 571 special access

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1 lines for Manti telephone. The Division sent a data request to Manti Telephone (and other
2 Rural ILECs) to verify the number of special lines and private lines by wire center. The
3 data response indicated that Manti Telephone has a special access and private line total in
4 excess of over 1,100 (on a DS-0 basis). These lines were subtracted from the total line
5 count and entered as the target special/private line count for Manti telephone. The
6 worksheet then calculated the new line count for each category type based on previous
7 cluster information. These new numbers were then entered in the respective cluster
8 categories for Manti Telephone, in the Cluster Table, of the HM database file. Attachment
9 B shows the corrected numbers that should be used for Manti Telephone Company in the
10 HM database.

11
12 **Q. IS THE SPECIAL ACCESS / PRIVATE LINE DATA USED ELSEWHERE?**

13 A. Yes. In review of the UT_DISTANCE file, special access and private line data are entered
14 in column AY through BC for each company, by wire center. The HAI 5.2a model uses
15 this data to model sufficient Special Access/Private Line trunks in the resultant spreadsheet.
16 The Division updated the data for Manti Telephone Company to reflect the data response
17 for each wire center in the company. These changes are reflected in the UT_DISTANCE
18 file in Appendix A (electronically filed).

19
20 **Q. BRIEFLY DISCUSS THE SWITCHING MODULE MODIFICATION.**

21 A. Western Wireless would accept the use of the HAI 5.2a model if the model's Switching
22 Module was updated with an improved algorithm to calculate overall ADM investment.

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1 The change primarily focused on the issue that the HAI5.2a model as originally filed in
2 Utah included investments in OC-48 ADM as well as OC-3 SONET multiplexers.
3 Forward-looking switches allow direct DS-3 and OC-3 trunk interfaces thus rendering the
4 additional investment unnecessary. HAI consulting prepared the updated switching
5 module which has the OC-3 multiplexer investment removed from the overall ADM
6 investment calculation. The updated module retains the OC-3 investment calculations for
7 the small-office and host/remote cases. The parties received the updated switching module,
8 and after some review, have come to agreement to incorporate the update into the HAI 5.2a
9 switching module. Attachment C (electronically filed) contains the file R52_switching_io
10 which is the updated switching module. This file needs to be placed in the Modules folder
11 of the HAI 5.2a cost model.

12
13 **V. MODEL OPERATION AND RESULTS**

14
15 **Q. PLEASE DESCRIBE YOUR ROLE IN THE COST MODELS RUNS.**

16 A. Ms. Egbert and I worked as a team in the development of the input figures used in the
17 models and the running of the models. My involvement was more focused towards the
18 model's operation and functionality. I also validated some of the calculations, ran the cost
19 models, analyzed the results for inconsistent expectations, and performed other duties
20 related to the cost model validation process. I also validated the HAI 5.2a model database
21 and distance files and compared it to the HAI 5.0a model submitted by the rural ILECs. In

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1 addition, I performed comparisons of input and output using applications which I wrote to
2 automate the process.

3

4 **Q. DID THE COMMISSION ORDER INPUT VALUES INTO THE HAI 5.2A MODEL**
5 **FOR THE QWEST UNE LOOP DOCKET 01-049-85?**

6 A. Yes. The Utah Public Service Commission Ordered input values in the Qwest UNE Loop
7 Docket. These input value changes are discussed in the testimony of Ms. Egbert of the
8 Division. However, not all of the Commission input values used to generate the Qwest's
9 \$12.94 average UNE Loop rate were used in generating the applicable rates for the Rural
10 ILECs in this docket as explained in Ms. Egbert's testimony.

11

12 **Q. PLEASE DISCUSS THE INPUTS FACTORS CHANGES IN THE DIVISION'S**
13 **MODELS?**

14 A. The HAI 5.2a cost model allows users to modify the input factors through the model's
15 interface. These factor modifications are in addition to the database, distances, and module
16 changes discussed earlier. The Division primarily focused its modifications to what the
17 Commission Ordered in Docket #01-049-85; and, as adjusted for the Rural ILECs on a
18 company specific basis. The company specific adjustments were mainly to the individual
19 company's capital structure, corporate overhead rate, depreciation lives, and percent of
20 aerial, buried, and underground placement methods.

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1 **Q. WILL YOU BE DISCUSSING THE SPECIFIC INPUTS FACTORS USED IN THE**
2 **COST MODELS?**

3 A. No, the argument of the actual input values used in the cost models is discussed in detail in
4 the Direct Cost Analysis Testimony of Ms. Peggy Egbert of the Division. In addition,
5 reference to the testimonies filed in docket 01-049-85 and the Commission's Order should
6 be made for further clarification and understanding of the input values used by the Division
7 for its cost model for the rural ILECs.

8

9 **Q. ARE YOU FILING THE INPUTS FACTORS USED IN THE COST MODELS?**

10 A. Yes. The specific input values used to generate the rates for each of the Rural ILEC
11 Companies are in Attachment D at the end of my testimony.

12

13 **Q. PLEASE DESCRIBE THE PROPOSED RATES.**

14 A. The Division submits the following proposed rates for the Rural ILECs using the HAI 5.2a
15 model and modifications stated above. These rates are shown below in Table 1. It should
16 be noted that the HAI 5.2a model, under flat rate switching, does not generate a per minute
17 end office switch rate. Instead, a per line per month End Office Switch Port charge is
18 calculated. It is my understanding that this port charge would be recovered by the
19 respective company from their customers and not from any interconnection agreement.
20 Furthermore, for companies with wire centers that use a Host-Remote configuration, Table
21 1 shows a rate which is more appropriate since it includes a Host-Remote switching rate.
22 Ms. Egbert further explains the reasoning behind these changes.

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1 Table 1 – DPU’s proposed rates submitted for the Rural ILECs using the HAI 5.2a
2

		Division Proposed (HAI5.2a) End Office Switch Port	Division Proposed (HAI5.2a) End Office	Division Proposed (HAI5.2a) End Office w/Host-Remotes	Division Proposed (HAI5.2a) Tandem Common
Gunnison	End Office Switch Port	8.59	--		--
	Signaling (ISUP)		.00016	N/A	.00016
	Common Transport		--		.00156
	Tandem Switching		--		.00147
	Total Rate		.00016		.00319
Manti	End Office Switch Port	7.32	--	--	--
	Signaling (ISUP)		.00034	.00034	.00034
	Common Transport		--	.00509	.00509
	H-R Switching (MOU)		--	.00051	--
	Tandem Switching		--	--	.00089
	Total Rate		.00034	.00594	.00632
South Central	End Office Switch Port	8.11	--	--	--
	Signaling (ISUP)		.00197	.00197	.00197
	Common Transport		--	.02417	.02417
	H-R Switching (MOU)		--	.00046	--
	Tandem Switching		--	--	.00054
	Total Rate		.00197	.02660	.02668
UBET	End Office Switch Port	4.92	--	--	--
	Signaling (ISUP)		.00016	.00016	.00016
	Common Transport		--	.00153	.00153
	H-R Switching (MOU)		--	.00046	--
	Tandem Switching		--	--	.00059
	Total Rate		.00016	.00215	.00228
Uintah Basin Telecom Assoc.	End Office Switch Port	7.82	--	--	--
	Signaling (ISUP)		.00284	.00284	.00284
	Common Transport		--	.02705	.02705
	H-R Switching (MOU)		--	.00052	--
	Tandem Switching		--	--	.00057
	Total Rate		.00284	.03041	.03045

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1 **Q. PLEASE DESCRIBE PROPOSED DEDICATED TRANSPORT RATES.**

2 A. It is my understanding that unless the Rural ILECs have a trunk dedicated for Western
3 Wireless traffic, the Rural ILECs will not collect Dedicated Transport rates. In the case if
4 the Rural ILECs ever have such an arrangement, Table 2 shows the Division's proposed
5 rates for Dedicated Transport.

6

7 Table 2 – DPU's proposed Dedicated Transport rates for the Rural ILECs using HAI 5.2a

	End Office	End Office w/ Host-Remote	Tandem
Gunnison Telephone Company	0.00156	N/A	0.00156
Manti Telephone Company	0.00507	0.00507	0.00507
So. Central Utah Telephone Association	0.00425	0.00425	0.00425
UBET Communications	0.00138	0.00138	0.00138
Uintah Basin Telephone Association	0.02322	0.02322	0.02322

8

9

10 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

11 A. For this docket, I recommend that the Commission use the Division's HAI 5.2a model as
12 the platform in the development of the rates for the Rural ILEC companies with the
13 accompanying modifications and Commission Ordered factors as modified by the Division
14 for the respective Rural ILECs. I feel that for the reasons discussed above, and in

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1 conjunction of the arguments presented by other Staff members, that the Division's cost
2 models would be more representative of an appropriate cost for the purpose of this docket.

3

4 **Q. IS THERE ANYTHING ELSE YOU WOULD LIKE TO STATE?**

5 A. Yes. The Division believes that the HAI 5.2a model should be viewed as a tool to model a
6 theoretical network and generate costs and resulting rates. With some data, which is
7 beyond all the parties' control, at such theoretical level (such as 24% geo-coding success
8 rate for density zone 0, which implies 76% theoretical placement), the Commission should
9 note that the results of the model are thus accordingly also somewhat theoretically based.
10 However, barring further evidence to the contrary, the Division stands by the results of its
11 model runs for the Rural ILEC. Based on the Division's analysis and best available data
12 which the Division currently possesses, the Division supports the results of its model runs
13 and advocates that the Commission use the rates that were generated by the Division's cost
14 models to set the inter-connection rates between the Rural ILECs and Western Wireless.

15

16

17

VI. CONCLUSION

18

19 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

20 A. Yes it does. Thank you.