

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION STAFF  
RESPONSE TO BENCH REQUEST NO. 42

DATE PREPARED: April 20, 2001

CASE NO: UT-003013 *Part B*

REQUESTER: BENCH

RESPONDER: JING Y. ROTH

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**BENCH REQUEST NO. 42 (for all parties)**

The Commission requests that the parties comment on the following proposal for identifying the cost of an end-office digital switching machine. The procedures described below could be used to establish the cost of the traffic sensitive elements on a switch, as well as the port.

In the Eighth Supplemental Order, Docket UT-960369 (hereafter Eighth Supplemental Order), the following cost function for digital switching is described at paragraph 299.<sup>1</sup> Switching investment =  $185,374 + 107 * \text{number of lines}$ .

This cost function could be used to estimate the cost of call set-up, port termination, and per minute of use.<sup>2</sup> The following numerical example illustrates how the calculation could be undertaken.

Paragraph 300 of the Eighth Supplemental Order indicates that the average line size of a GTE switch is 4,300. In this proceeding the Bench requested data from Qwest and Verizon on the number of originating and terminating calls during the busy-hour, as well as busy-hour CCS per line. For the limited purpose of this question, we will assume that each line places or receives 2 calls during the busy-hour and that the busy-hour CCS per line is 3 CCS (or 5 minutes).

For the limited purpose of this cost calculation, we will assume that the getting-started investment of a switch, \$183,374, is only used to set up and take down calls.<sup>3</sup> This would suggest that the busy-hour investment per originating or terminating call is \$185,374 dollars divided by 8,600 (4,300 lines times two calls per line). This suggests an investment per busy-hour call of \$21.55.<sup>4</sup>

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<sup>1</sup>Note that these figures are in 1995 dollars. Interested parties are asked to address the need to use a telephone plant index to convert the 1995 to 2001 dollars.

<sup>2</sup>As pointed out at paragraph 299 of the Eighth Supplemental Order, the FCC Staff developed this investment function. Subsequently the Federal Communications Commission adopted "the fixed costs (in 1999 dollars) of a remote switch as \$161,800 and the fixed cost (in 1999 dollars) of both host and stand-alone switches as \$486,700. [The FCC] adopt[ed] the additional cost per line (in 1999 dollars) for remote, host, and stand-alone switches as \$87." [footnote omitted] Tenth Report and Order, CC Docket No. 96-45, FCC 99-304, released November 2, 1999. Par. 296. The parties may want to comment on substituting the investment function adopted by the FCC in its 10<sup>th</sup> Report and Order at paragraph 296 for the investment function identified at paragraph 299 of the Eighth Supplemental Order.

<sup>3</sup>The getting-started investment, such as the central processor, is used for other purposes (e.g., billing, providing vertical features, conducting maintenance tests) than just originating and terminating calls.

<sup>4</sup>As pointed out at paragraph 300 of the Eighth Supplemental Order, if the cost function  $\$185,374 + \$107 * \text{lines}$  is used to estimate the investment in switching, the average investment per line for GTE was \$150. The value of \$150 was used by the Commission at paragraph 312 of the Eighth Supplemental Order in its determination of the port and per minute rate. At paragraph 305 of the Eighth Supplemental Order the Commission noted that Qwest had 10,740 lines at each switch. Using the formula identified at paragraph 299 of the Eighth Supplemental Order, this

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Calls can be placed during any hour of the day and therefore the busy-hour investment has to be converted to a per call investment. This process is described at paragraph 316 of the Eighth Supplemental Order. Using the data from paragraph 318 for U S WEST, we assume for the purpose of this question that one busy-hour call is equivalent to 3,296 annual calls. This suggests an investment per call of \$.00654.

Per paragraph 319 of the Eighth Supplemental Order, the investment per call can be converted to a cost per call by multiplying the investment by the annual charge factor. The Eighth Supplemental Order used a value of 22.95%. This suggests that the set-up (direct) cost per call is  $\$.00654 * .2295 = \$.001501$ .

Finally, at paragraph 207 of the Seventeenth Supplemental Order, the Commission adopted a 4.05% common cost mark-up for switching elements. This would suggest that the TELRIC for a call set-up is  $\$.001501 * 1.0405 = \$.001562$ .

The Table below summarizes the calculations described above:

**Table One**

Line Number	Value	Description
(1)	185,374	getting started investment assigned to messages
(2)	4300	number of lines
(3)	2	number of calls per line during busy-hour
(4) = (1)/[(2)*(3)]	21.5551163	investment per busy-hour call
(5)	3296	peak to total conversion per par. 318, 8th Supp. Order
(6) = (4)/(5)	0.00653978	annualized per message investment
(7)	22.95%	annual charge factor per par. 320, 8th Supp. Order
(8)=(6) * (7)	0.00150088	per message direct cost
(9)	4.05%	common cost factor per par. 207, 17th Supp. Order
(10) = (8) * (1 + (9))	0.00156167	TELRIC per message

Assuming that the getting started investment of a switch is a traffic sensitive investment, this implies that the port rate developed by the Commission in Docket UT-960369 does not need to be modified. The per minute rate would need to be adjusted. The following table provides the methodology that could be used to develop the per minute rate:

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would suggest an investment of  $[183,374 + 107 * 10,740]/10,740 = \$124.26$  per line. The Commission's calculations at paragraph 312 assumed an investment per line of \$150. Parties are encouraged to address how, if the Commission were to adopt the procedure described in this bench request, the difference in the number of lines at Qwest and Verizon's switching machines should be taken into account.

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**Table Two**

Line Number	Value	Description
(1)	645,474	total investment = 185,374 + 4300 * 107
(2)	55%	percent traffic sensitive per par. 314, 8th Supp Order
(3) = (1) * (2)	355,011	traffic sensitive investment
(4)	185,374	getting started investment assigned to messages
(5) = (3) - (4)	169,637	traffic sensitive investment assigned to minutes
(6)	5	minutes of use per line per busy-hour per par. 318, 8th Supp. Order
(7)	4300	number of lines
(8)=(5)/(7)/(6)	7.89007907	investment per busy-hour minute
(9)	3296	peak to total conversion per par. 318, 8th Supp. Order
(10) = (8) / (9)	0.00239383	annualized per minute investment
(11)	22.95%	annual charge factor per par. 320, 8th Supp. Order
(12) = (10) * (11)	0.00054939	per minute direct cost
(13)	4.05%	common cost factor per par. 207, 17th Supp. Order
(14) = (12) * (1+(13))	0.00057164	TELRIC per minute

The tables rely on usage data from UT-960369. If this methodology were to be adopted by the Commission, the Table would need to be updated to reflect more current data (e.g., current busy-hour minutes of use).

**RESPONSE:**

**Staff's first and foremost point regarding the rates for reciprocal compensation is that the WUTC should order a more cost-based rate structure for all local traffic. The costs should be calculated based on the costs that the originating carrier would incur had the call terminated on its own network. Staff believes that it is appropriate to establish a rate structure in which the rates vary inversely with the load factor of the traffic being terminated.**

**Staff understands that the rates developed in this bench request are based on the Commission's prior decision on switching rates in the Eighth Supplemental Order in UT-960369 et al. Because of the nature of this bench request, the assumptions made, and the limited data presented, Staff supports these rates, with updated information incorporated, as interim rates.**

**As for permanent rates, Staff believes, as we said in the cross examination during the hearing, that the Commission should first decide upon a rate methodology and structure addressing call setup and call duration, as well as the other issues of tandem switching and**

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**load factor. The Commission should then require the parties involved to put forward cost evidence to support what they believe the appropriate rate(s) should be. This result would be the default that either party could insist upon in an interconnection agreement. If billing constraints or other reasons led companies to mutual agreement to use another structure, that should be permitted.**

**This approach may not require a great deal of additional evidence; the experience in other states, such as Texas and California, suggests that parties can reach agreement on details of the rate(s) once the Commission makes the fundamental rate design decision.**