BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION
COMMISSION

In the Matter of the Review of	)	
Unbundled Loop and Switching Rates; the	)	DOCKET NO. UT-023003
Deaveraged Zone Rate Structure; and	)	
Unbundled Network Elements, Transport,	)	
and Termination	)	
	)	

**SUPPLEMENTAL PANEL TESTIMONY
OF VERIZON NORTHWEST INC.
ON RECURRING COSTS**

Witnesses:
John Hinton
William Jones
Thomas Mazziotti
Randall Patton
Willett Richter
David Tucek

**January 26, 2004
PUBLIC**

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1   **Introduction**

2

3   **Q   WHO ARE THE MEMBERS OF THE RECURRING COST WITNESS**

4   **PANEL SPONSORING THIS TESTIMONY?**

5   A   The members of this Panel are: John Hinton, William Jones, Thomas

6   Mazziotti, Randall Patton, Willett Richter, and David Tucek. Mr. Hinton has

7   reviewed and supports the panel testimony filed by Verizon Northwest Inc.

8   ("Verizon NW") on June 26, 2003. He has assumed primary responsibility for the

9   testimony concerning the structure and features of the VzCost system previously

10   discussed by Michael Norris, who retired in November 2003. In addition, Mr.

11   Tucek has reviewed the June 26, 2003 panel testimony and has assumed

12   primary responsibility for the testimony concerning loop and interoffice transport

13   UNEs previously discussed by Gary Sanford, who also retired in November

14   2003. Mr. Tucek has also reviewed and supports the testimony of Mr. Dye on

15   geographic deaveraging filed on June 26, 2003, and has assumed primary

16   responsibility for the updated geographic deaveraging portions of this

17   supplemental testimony.

18   **Q   MR. HINTON, PLEASE DESCRIBE THOSE ASPECTS OF YOUR**

19   **PROFESSIONAL BACKGROUND MOST PERTINENT TO YOUR TESTIMONY.**

20   A   I have been employed by Verizon Services Corp. in Verizon's

21   Finance Department's Service Costs organization (or its predecessor) for 22

22   years. I received a Bachelor of Science degree from New Jersey Institute of

23   Technology in Industrial Engineering. My current responsibilities include the

1 ongoing development, testing, training and implementation with respect to the

2 VzCost model.

3 **Q   MR. TUCEK, PLEASE DESCRIBE THOSE ASPECTS OF YOUR**

4 **PROFESSIONAL BACKGROUND MOST PERTINENT TO YOUR TESTIMONY.**

5   A   Since November 2003, I have been employed as Senior Vice

6 President at Network Engineering Consultants, Inc. ("NECI"). NECI specializes

7 in the fields of cost model analysis and development and local telephone network

8 engineering, planning and implementation. From August 1996 until that time, I

9 was employed by Verizon Services Corp. in Verizon's Finance Department's

10 Service Costs organization (or its predecessor), where my responsibilities

11 included reviewing, analyzing, and supervising cost studies and cost study

12 methodologies. I have a Bachelor of Science degree in Mathematics and

13 Economics from Southeast Missouri State University, and a Master of Arts

14 degree in Economics from the University of Missouri. I also have a Master of

15 Business Administration degree from St. Louis University. I began my career in

16 the telecommunications industry as a Senior Cost Analyst with Contel Service

17 Corporation in 1979. During the course of my career, I have held various

18 positions dealing with cost analysis and modeling, rate design, tariff

19 development, carrier billing, and demand analysis. I have sponsored testimony

20 or conducted technical workshop presentations before state public utility

21 commissions in Alabama, Arkansas, California, Florida, Hawaii, Illinois, Indiana,

22 Iowa, Kentucky, Michigan, Missouri, Ohio, Nebraska, New Mexico, North

23 Carolina, Pennsylvania, Texas, Virginia, and Washington.

1   **Q   WHAT IS THE PURPOSE OF THIS FILING?**

2   A   The principal purpose of this filing is three-fold:

3   (1)   to update Attachment A of the June 26, 2003 panel testimony to

4   reflect (in the corresponding Attachment A-1 to this supplemental testimony) the

5   FCC's intervening decision in the Triennial Review proceedings, modifying the

6   unbundling requirements for network elements previously established under the

7   Telecommunications Act of 1996.[1]

8   (2)   to update the cost studies supporting the loop and interoffice

9   transport rate elements, based on a more recent version of VzLoop, VzCost's

10   loop investment calculator described in the June 26, 2003 panel testimony.

11   (3)   to update Verizon NW's deaveraging proposal in light of the

12   resulting changes in loop costs per wire center**.**

13   **I.   UPDATED LIST OF UNES**

14   **Q   HOW HAS VERIZON MODIFIED THE LIST OF UNES FOR**

15   **WHICH IT IS PROPOSING RECURRING PRICES IN THIS DOCKET?**

16   A   Verizon NW modified the list of UNEs to reflect the recent changes

17   made to unbundling requirements in the FCC's *Triennial Review Order.* As a

18   result of the Triennial Review proceeding, Verizon is not required to unbundle

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[1]   *See Report and Order on Remand and Further Notice of Proposed Rulemaking, Review of Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Deployment of Wireline Services Offering Advanced Telecommunications Capability*, 18 FCC Rcd 16978 (2003) ("*Triennial Review Order*"), *petitions for review pending sub nom. United States Telecom Association v. FCC*, Nos. 000-1012 *et al.* (D.C. Cir. oral argument scheduled Jan. 28, 2004).

1   any subloops other than copper distribution subloop and other types of

2   distribution subloop to multi-unit premises. *Triennial Review Order* ¶¶ 253-54, 18

3   FCC Rcd at 17131-2. Nor is it required to unbundle OCn loops or OCn transport,

4   *Triennial Review Order*, 18 FCC Rcd at 17104, 17168, 17221, ¶¶ 202, 315, 389

5   or to include transmission links between Verizon NW central offices and CLEC

6   central offices in the dedicated transport UNE. Verizon NW's new list reflects

7   each of these changes. Verizon NW reserves the right to modify this list further

8   in response to any additional changes that are made to the FCC's unbundling

9   requirements. In addition, Verizon has added in its new Attachment A-1 rates for

10   multiplexing that were omitted from the earlier Attachment A.

11   **II.   UPDATED LOOP AND INTEROFFICE TRANSPORT STUDIES**

12   **Q   WHAT CHANGES HAS VERIZON MADE TO VZLOOP?**

13   A   Verizon has enhanced VzLoop by creating a new version of the

14   program, Version 07, which forms the basis for the new cost studies included

15   with this filing, and the revised UNE recurring rate proposals included as

16   Attachment A-1 hereto. A comparison of these new proposed rates to those

17   previously filed with Verizon NW's testimony dated June 26, 2003, is included as

18   Attachment A-2 to this supplemental testimony. There are four kinds of changes

19   reflected in Version 07 of VzLoop: (1) the addition of new options for VzLoop

20   users; (2) the addition of costs that were inadvertently omitted in the design of

21   Version 06; (3) modifications to the operation of VzLoop's code; and (4)

22   enhancements to VzLoop's output tables.

23   **Q   PLEASE DESCRIBE THE NATURE OF THESE CHANGES.**

1   A   VzLoop has a variety of enhancements that make its modeling

2   more accurate. Among other things, these enhancements make it possible to

3   model aerial or buried distribution plant along the same route as underground

4   feeder; to model underground structure within a user-specified distance from the

5   wire center; and to specify the input for pole-spacing for each wire center. These

6   and other model enhancements are described more fully in the revised VzLoop

7   Cost Manual, which is attached to this testimony as Attachment B.

8   Version 07 of VzLoop also takes into account a number of costs that were

9   omitted in Version 6.   These include the costs of the entrance cables for building

10   terminals; the cost of pulling underground cable through a conduit; the placement

11   costs that a company must sustain even when another party opens a trench; and

12   the costs associated with placing sealed terminals in underground locations.

13   Version 07 also makes the modeling of the loop investment more accurate

14   by modifying the operation of VzLoop's code. For example, it corrects a routine

15   that, in certain conditions, caused copper loop lengths to exceed the maximum

16   copper loop length limit specified by the user; corresponding changes were also

17   made to the preprocessing code where needed. Version 07 also prevents a fiber-

18   to-the-premises DLC location from serving as an SAI or DLC for an entire

19   distribution area, and revises the calculation of modeled copper-feeder fill at the

20   head-of-route to include all copper pairs at the main distribution frame.

21   Additionally, Version 07 includes inputs for the number of fibers per remote

22   terminal location that is modeled for the local loop and a corresponding input for

1   the fibers modeled for other services using fiber facilities.[2] The remaining

2   changes to VzLoop's code are described in the revised VzLoop Cost Manual.

3   Finally, Version 07 of VzLoop makes two enhancements to VzLoop's

4   output tables. First, it calculates the total number of foreign poles for the

5   INVENTORY table; note that the number of foreign poles is provided for

6   informational purposes only, and that VzLoop does not model any investment for

7   foreign poles.   Second, Version 07 creates a new output table (the "Loop

8   Constants Value" table) that includes demand values applying to subsets of the

9   loop costs, such as distribution and feeder.

10   **Q**   **HAS VERIZON NW MADE ANY OTHER CHANGES THAT ARE**

11   **REFLECTED IN THESE UPDATED COST STUDIES?**

12   A   Yes. When Verizon NW re-ran its cost studies using Version 07 of

13   VzLoop, it also enhanced the accuracy of its location of network facilities

14   reflected in the NETWORK table. First, through comparison with additional

15   planning system records, Verizon NW was able to identify additional existing

16   SAIs and DLCs for use in the model. Second, it refined its methodology for

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[2]   These inputs replace VzLoop's NUM_FIBER input which previously specified the number of fibers modeled per remote terminal and the fraction of the total modeled fiber facility investment assigned to the loop specified in the BC mapping. In this supplemental filing, NUM_FIBER now corresponds to the number of fibers assigned to local and two new inputs, NUM_FIBER_IOF and NUM_FIBER_DSL, specify the fibers assigned to IOF and to other services using fiber facilities. These inputs are assigned values of 6, 4, and 2, respectively, in the current filing, so that 12 fibers are still modeled per RT in the supplemental filing. The amount of modeled fiber investment assigned to the local loop is based on the relative share of the fibers assigned to the local loop. In both the initial and supplemental filings, this share is one half and includes both the material and placement costs of the fiber and the supporting structures.

1   cross-checking geocoded locations for distribution terminals against plant

2   records by reformatting those plant records to permit more reliable comparisons.[3]

3   While Verizon NW has not changed the methodology used to

4   calculate the Forward-Looking Calibration ("FLC") or the Expense Factors

5   and Loadings,[4] the values of those inputs changed when the cost studies were

6   re-run with new forward-looking investments. All of these changes are reflected

7   in updated workpapers being filed with this supplemental testimony.

8   **Q   WERE THE NEW LOOP COST STUDIES RUN PURSUANT TO**

9   **VERSION 07 OF VZLOOP OTHERWISE CONDUCTED AS DESCRIBED IN**

10   **THE JUNE 26, 2003 PANEL TESTIMONY?**

11   A   Yes. However, some modifications to the Loop BC families and

12   Cost Templates were required to reflect the changes made in Version 07. These

13   changes are described in detail in the file "Version 7 Changes to Loop BC

14   Families Jan 20 04.doc" on CD No. 4 in the "Version 7 BC Family Changes"

15   subfolder. The modified BC families and Cost Templates were then run in the

16   same manner as described in the June 26, 2003 panel testimony.

17   **Q   WHY WAS IT NECESSARY TO RERUN THE INTEROFFICE**

18   **TRANSPORT STUDIES AS WELL?**

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[3]   In addition, the geographical coordinates for six wire centers are incorrectly listed in the MASTER file. While these data do not affect the calculations made in VzLoop, the correct coordinates for these wire centers have been included here: MTVIWAXX -122.17, 48.06068; BGLKWAXX -122.2451, 48.40104; EVRTWAXF -122.2052, 47.98526; MRBLWAXX -121.4428, 48.33781; EVSNWAXX -122.3398, 48.91482.

[4]   *See* Panel Testimony of Verizon NW on Recurring Costs (Public), June 26, 2003, at 151-56.

1   A.   As described on page 14 of the June 26, 2003 panel testimony, the

2   interoffice transport cost studies are based upon a capacity costing approach that

3   relies as a first step on the average per-strand-foot fiber investment developed by

4   VzLoop. Because Version 07 of VzLoop has resulted in revised estimates of the

5   per-strand-foot fiber costs, it was also necessary to rerun the IOF cost studies.

6   This is the only change made to the IOF and High Capacity loop studies. Any

7   impacts of these changes on other costs are not expected to be significant, but

8   Verizon NW will reflect them in its ultimate compliance filing in this docket.

9   **III.   REVISED DEAVERAGED ZONE RATE STRUCTURE**

10   **Q   WHAT CHANGES DO THESE REVISED LOOP COSTS**

11   **REQUIRE TO THE JUNE 26, 2003 DEAVERAGING TESTIMONY FILED BY**

12   **VERIZON NW?**

13   A.   As was the case in the deaveraging proposal previously submitted

14   by Verizon NW, the zones are determined based on a comparison of the

15   modeled local loop cost, on a per-line basis, for each of Verizon NW's 99 wire

16   centers. Attachment C contains a graph showing the per-line 2-wire loop cost for

17   each of Verizon NW's wire centers. These wire center-specific costs were

18   derived from VzCost, and can be found in the workpapers accompanying this

19   supplemental filing.[5] Verizon NW thus bases its deaveraging proposal on

20   appropriate cost characteristics, as required by the FCC and the Commission,

21   which has required that "the wire center, rather than the exchange, is the

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[5]   In particular, see the file "WA_Deavg_0104.xls" in the "Deaveraging
Workpapers" zip file.

1 appropriate unit for building rate zones."[6] Verizon NW continues to believe that

2 the Commission should establish UNE loop rates for Verizon NW in no more than

3 three cost-based zones. Verizon NW's updated proposed deaveraging zones

4 are shown in the following table:

Wire Centers - Zone 1		Wire Centers - Zone 2	Wire Centers - Zone 3
ACME	LAKE GOODWIN	ALGER	LATAH
ANACORTES	LAKE STEVENS	BENTON CITY	BREWSTER
ARLINGTON	LAUREL	BRIDGEPORT	CURLEW
BIG LAKE	LEAVENWORTH	CHELAN	FAIRFIELD
BIRCH BAY	LYNDEN	CONCRETE	FARMINGTON
BLAINE	MANOR WAY	COUPEVILLE	GARFIELD
BOTHELL	MAPLE FALLS	CUSTER	GEORGE
BURLINGTON	MARBLEMOUNT	DEMING	LOOMIS
CAMANO ISLAND	MARYSVILLE	EDISON	MALDEN
CAMAS	MONROE	ENTIAT	MANSFIELD
CASHMERE	MOUNT VERNON	EVERSON	MOLSON
CLEARVIEW	NACHES	LAKE WENATCHEE	OAKSDALE
CONWAY	NORTH RICHLAND	LYMAN-HAMILTON	ROCKFORD
DARRINGTON	OAK HARBOR	MANSON	ROSALIA
DUVALL	REDMOND	NEWPORT	TEKOA
EAST WENATCHEE	RICHLAND	NILE	THORNTON
EVERETT - CASINO	RICHMOND BEACH	PALOUSE	TONASKET
EVERETT - MAIN	SAMMAMISH	PULLMAN	WATERVILLE
FERNDALE	SEDRO WOOLLEY	QUINCY	
GRANITE FALLS	SILVER LAKE	REPUBLIC	
GRAYLAND	SNOHOMISH	SKYKOMISH	
HALLS LAKE	STANWOOD	SOAP LAKE	
JUANITA	SULTAN	STEVENS PASS	
KENNEWICK - HIGH	WASHOUGAL	SUMAS	
KENNEWICK - MAIN	WENATCHEE	WASHOUGAL RIVER	
KENNEWICK - MEADOW SPRINGS	WEST RICHLAND		
KIRKLAND	WESTPORT		
LACONNER	WOODLAND		

5

6 **Q WHAT METHOD IS VERIZON NW USING TO DETERMINE**

7 **PROPOSED DEAVERAGED ZONES?**

8   A. Verizon NW has modified its deaveraging methodology to account for

9 significant break points in the loop costs by wire center and to minimize the

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[6]   *Twenty-Fourth Supplemental Order* in Docket Nos. UT-960369, 960370,
960371, at ¶ 61 (2000).

1   dispersion of the wire center costs from the average cost for each deaveraged

2   zones. First, a review of Attachment C reveals a break, or point of discontinuity,

3   in the wire center costs beginning with the LATAH wire center. This wire center

4   has the 82nd highest loop cost per line among Verizon NW's wire centers. Thus,

5   this wire center and the 17 other wire centers with higher loop costs per line were

6   assigned to the third zone. The remaining 81 wire centers were divided into two

7   zones designed to minimize the line-weighted root mean square error (RMSE)

8   measure of dispersion.

9   **Q. PLEASE EXPLAIN THE RMSE DISPERSION MEASURE.**

10   A.   The RMSE dispersion measure is most easily understood by

11   examining Attachment D, which depicts Verizon NW's three proposed zones with

12   the same curve shown in Attachment C. The task of dividing the remaining 81

13   wire centers into two zones can be viewed as selecting a step-function to

14   approximate the cost curve to the left of Zone 3. The height of each step

15   corresponds to the line-weighted average per-line cost for each zone, and the

16   width is determined by the number of wire centers assigned to each zone. The

17   difference between the curve and the step function is the deviation (or "error")

18   between the wire center costs and the average (or predicted) value for each

19   zone. The line-weighted RMSE measure is just the square root of the sum of the

20   line-weighted squared errors for each of the wire centers.[7] Squaring each error

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[7]   The square root of the sum is taken so that the units underlying the RMSE measure are expressed in terms of dollars, instead of dollars squared. Minimizing this error measure is the same as minimizing the sum of the squared residuals in a weighted least-squares regression.

1   term achieves two desirable results. First, it prevents negative errors from

2   canceling out positive errors. Second, it emphasizes the impact of large

3   deviations from the zone average, so that satisfying the RMSE criterion avoids

4   large prediction errors if at all possible. Additionally, multiplying each squared

5   error measure by the corresponding wire center's relative line size gives more

6   weight to large wire centers than to small ones — a large error for a very small

7   wire center is not of as much concern as a smaller error for a much larger wire

8   center. The RMSE is thus designed to measure, and the creation of zones is

9   designed to minimize, the dispersion from the average per-line cost in each zone.

10   **Q.   WHAT ARE THE RESULTING RATES FOR EACH ZONE?**

11   A.   The resulting rates are shown in the table below:

	Proposed Rate	Number of Wire Centers	Percent of Lines
Zone 1	$28.73	56	93.3%
Zone 2	$80.73	25	5.4%
Zone 3	$194.12	18	1.3%

12

13   **Q.   HAS VERIZON DEVELOPED RATES USING THIS**

14   **METHODOLOGY FOR A FIVE-ZONE STRUCTURE?**

15   A.   Yes. To derive the five-zone structure, the 18 highest-cost wire

16   centers starting with LATAH were constrained to Zone 5, and the remaining 81

17   wire centers were assigned to four zones by minimizing the line-weighted RMSE

18   measure. A graph of the alternative five-zone proposal appears in Attachment E.

19   The resulting rates are depicted in the table below:

	Proposed Rate	Number of Wire Centers	Percent of Lines
Zone 1	$22.95	14	54.8%
Zone 2	$34.73	30	32.4%
Zone 3	$54.44	26	9.0%
Zone 4	$100.36	11	2.4%
Zone 5	$194.12	18	1.3%

1

2 As noted in its June 26, 2003 testimony, Verizon NW still believes that the

3 Commission need only deaverage its rates into the three zones presented above.

4 **IV.   OTHER CHANGES**

5 **Q   ARE THERE ANY OTHER ASPECTS IN WHICH VERIZON NW IS**

6 **SUPPLEMENTING ITS JUNE 26, 2003 DIRECT TESTIMONY?**

7 A.   Yes. Pages 52-53 of that testimony describes the capabilities of

8 VzLoop for modeling sharing of buried placement with other utilities. Contrary to

9 that description, VzLoop does not model plowing of more than one cable.

10 However, in Verizon's experience, because of the coordination requirements for

11 plowing, the interference limitations that would be associated with plowing

12 together with electric cables, and the ability of Verizon itself to satisfy its needs

13 through sizing larger cable, plowing more than one cable – whether both belong

14 to Verizon or one belongs to another company – is highly unlikely. In addition,

15 page 123 of that testimony, relating to DS3 high capacity loops, stated that the

16 SONET ring designs used to calculate DS3 high capacity loop costs are always

17 limited to two nodes. In fact, those designs include some three-node rings as

1 well – for example, to provide redundancy in the physical routing of the

2 transmission path.[8]

3   Finally, footnote 10 of Verizon NW's June 26, 2003 panel testimony stated

4 that its filing had included the source code for VzLoop in both PDF and text file

5 formats. Verizon NW's filing inadvertently omitted the text file version of that

6 source code, has included both PDF and text file formats of Version 07 of

7 VzLoop with this filing. Verizon NW is also including the VzCost formulas for its

8 updated cost studies and, on a separate CD, VzCost formulas that are and have

9 been available on-line, but were not included with its June 26, 2003 filing.

10 **Q   DOES THIS CONCLUDE THE PANEL'S TESTIMONY?**

11   A.   Yes.

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[8]   Verizon NW also hereby clarifies lines 7-8 of page 39 of the June 26, 2003
Panel Testimony by changing the words "permitting regulations that impose,
among other things, minimum spacing requirements between terminals" to
"permitting regulations; adequate spacing requirements at terminal, SAI, and
other plant equipment locations"