

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Pricing Proceeding	)	DOCKET NO. UT-960369
for Interconnection, Unbundled Elements,	)	
Transport and Termination, and Resale	)	
.....	)	
	)	
In the Matter of the Pricing Proceeding	)	DOCKET NO. UT-960370
for Interconnection, Unbundled Elements,	)	
Transport and Termination, and Resale for	)	
	)	
U S WEST COMMUNICATIONS, INC.	)	
	)	
.....	)	
	)	
In the Matter of the Pricing Proceeding	)	DOCKET NO. UT-960371
for Interconnection, Unbundled Elements,	)	
Transport and Termination, and Resale for	)	
	)	
GTE NORTHWEST INCORPORATED	)	<b>EIGHTH SUPPLEMENTAL ORDER</b>
	)	<b>INTERIM ORDER ESTABLISHING</b>
	)	<b>COSTS FOR DETERMINING</b>
	)	<b>PRICES IN PHASE II; AND</b>
	)	<b>NOTICE OF PREHEARING</b>
	)	<b>CONFERENCE</b>
.....	)	<b>(MAY 11, 1998)</b>

**BACKGROUND**

On November 21, 1996,<sup>1</sup> the Commission initiated the proceedings in these consolidated matters to consider cost and pricing issues arising out of the Commission's October 23, 1996 Order<sup>2</sup> in several arbitration dockets, and its obligations under the Telecommunications Act of 1996<sup>3</sup> to establish rates for interconnection, unbundled network elements, transport and termination, and resale. 47 U.S.C. § 252(d).<sup>4</sup>

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<sup>1</sup> Order Instituting Investigations; Order of Consolidation; and Notice of Prehearing Conference, Docket Nos. UT-960369,-960370,-960371 (November 21, 1996) (Generic Cost Case Order).

<sup>2</sup> Order on Sprint's Petition to Intervene and to Establish Generic Pricing Proceeding, Docket Nos. UT-960307,-960309,-960310,-960323,-960326,-960332 (October 23, 1996).

<sup>3</sup> Telecommunications Act of 1996, 47 U.S.C. § 151 *et seq.* (1996) (Act).

<sup>4</sup> While this proceeding implements the 1996 Act, the Commission also acts under authority of Title 80 RCW and Title 480 WAC. See, Fourth Supplemental Order, Docket No. UT-941465, *et seq.*

## SUMMARY

**Scope of Proceedings:** The Generic Cost Case Order commenced and consolidated three separate investigations, to be addressed by the Commission in two distinct phases of this proceeding. The first phase of this proceeding is a “generic” investigation to develop an appropriate and consistent cost methodology with which to determine the costs of providing certain telecommunications services. The second phase of this proceeding is an investigation of two local exchange companies (LECs), U S WEST Communications, Inc. (U S WEST), and GTE Northwest Incorporated (GTE), to determine, using the cost methodology and costs we establish in the instant Order, the proper level of prices to be charged by these companies for interconnection, unbundled network elements, transport and termination, wholesale and resale discounts, and interim number portability and collocation.

The instant Order accomplishes the Commission’s goals of establishing a cost methodology and costs for use in the second phase of this proceeding. In Phase II, we will establish prices or price ranges based upon the cost methodology and costs. Those prices or price ranges will apply to agreements approved by the Commission in various arbitrated, negotiated, and adopted agreements executed by incumbent local exchange companies (ILECs), U S WEST and GTE, and various new entrant competitive local exchange companies (CLECs), and to all such future agreements executed between ILECs and CLECs registered to provide local exchange service in this state.

The Commission believes the instant Order is a seminal event in the implementation of the Act. The telecommunications industry and consumers must concur given the interest attending Phase I of this proceeding. The parties included fifteen telecommunications companies and three associations, in addition to Commission Staff and Public Counsel. In addition to over fifteen thousand pages of written testimony and exhibits, cost studies, and post-hearing briefs, the record includes over three thousand pages of transcribed hearings.

The Commission conducted eight days of evidentiary hearings before Commissioners Richard Hemstad and William R. Gillis, and Administrative Law Judge Terrence Stapleton, including a marathon 16½ hour hearing on the final day. The proceeding also included two pre-hearing workshops with cost modeling experts and the parties’ subject matter experts, and one post-hearing workshop in response to a Commission bench request.

The Commission gratefully acknowledges the significant effort, substantial resources, and enormous contribution of the parties in Phase I of this proceeding. We also acknowledge the contributions of the developers of the Hatfield Model and Benchmark Cost Proxy Model who, while not a direct party in name, nonetheless through their sponsoring parties, contributed significant amounts of time and resources to this proceeding.

Later in this Order, we notice Phase II of this proceeding, the pricing phase of these consolidated matters. The notice names the date for convening a pre-hearing conference, and requires U S WEST and GTE to distribute at that time the written testimony and exhibits and tariffs on which the Companies will rely in the pricing phase of this proceeding.

**Parties:** The following parties and their representatives appeared in Phase I of this proceeding: Richard E. Potter and John Williams for GTE Northwest Incorporated (GTE); Richard Finnigan for Washington Independent Telephone Association (WITA); Edward T. Shaw, Lisa Anderl, John Devaney, and Doug Owens for U S WEST Communications, Inc. (U S WEST); Carol Matchett for Sprint Communications Company, L.L.P. (Sprint); Seth M. Lubin for United Telephone Company of the Northwest (United); Clyde H. Maclver and Brooks Harlow for MCI Telecommunications Corporation (MCI), MCImetro Access Transmission Services Inc. (MCImetro), WorldCom Inc. d/b/a LDDS WorldCom (WorldCom), and Telecommunications Resellers Association (TRA); Elizabeth Thomas for Shared Communications Services, Inc. (SCS); Sara Siegler Miller for Frontier Telemanagement (Frontier); Gregory J. Kopta and for TCG Seattle (TCG) and NextLink Washington LLC (NextLink) and Debbi Waldbaum for TCG Seattle; Arthur A. Butler for Telecommunications Ratepayers for Cost-based and Equitable Rates (TRACER); Dan Waggoner, Mary Steele, and Susan Proctor for AT&T Communications of the Pacific Northwest, Inc. (AT&T); Ellen Deutsch and Rob McMillin for Electric Lightwave Inc. (ELI); Richard Rindler and Douglas Bonner for MFS Communications Company, Inc., and GST Telecom of Washington, Inc.; Gregory J. Trautman and Shannon E. Smith for Staff of the Washington Utilities and Transportation Commission (Commission Staff); and Robert F. Manifold for Public Counsel Section of the Office of the Attorney General (Public Counsel).

**Commission:** The Commission orders the following costs: (1) U S WEST loop cost of \$17.00 and GTE loop cost of \$20.00; (2) monthly port cost for both GTE and U S WEST of \$1.29, and per minute of use cost of the switch of \$0.00136 for GTE and \$0.00115 for U S WEST; (3) general wholesale discount for U S WEST of 14.69%; (4) cost of interim local number portability for both U S WEST and GTE of \$1.50; (5) for U S WEST, a nonrecurring loop installation cost of \$30.15 and disconnection cost of \$11.58.

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**MEMORANDUM<sup>5</sup>****I. PROCEDURAL**

1. On August 1, 1996, the Federal Communications Commission (FCC) adopted rules to implement the local competition provisions of the Act ("FCC Interconnection Order").<sup>6</sup> As the FCC notes in its Order at paragraph one:

The Telecommunications Act of 1996 fundamentally changes telecommunications regulation. \* \* \* In the new regulatory regime, we and the states remove the outdated barriers that protect monopolies from competition and affirmatively promote efficient competition using tools forged by Congress.

And, further, at paragraph three:

[W]e are taking the steps that will achieve the pro-competitive, deregulatory goals of the 1996 Act. The Act directs us and our state colleagues to remove not only statutory and regulatory impediments to competition, but economic and operational impediments as well.

In this proceeding, we continue the task of addressing economic and operational impediments to competition begun in Docket No. UT-941464, *et al*,<sup>7</sup> collectively referenced as the Commission's "Interconnection cases."

In this Order, we use many technical terms, from both the cost modeling discipline and the telecommunications industry generally, and provide at *Appendix C -- Definitions* to this Order a glossary of terms and their meaning.

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<sup>5</sup> Due to the technical complexity of the economic cost models we investigate in this proceeding, the sheer volume of qualitative and quantitative assumptions, inputs, and values we analyze and address, and the scope and breadth of our decision, each separately numbered paragraph of our Order constitutes a Commission finding. We augment those findings by a series of general findings at the end of this Order.

<sup>6</sup> *In the Matter of the Implementation of the Local Competition Rules of the Telecommunications Act of 1996*, CC Docket 96-98, First Report and Order (August 8, 1996), Appendix B - Final Rules.

<sup>7</sup> *Washington Utilities and Transportation Commission v. U S WEST Communications, Inc.*, Docket No. UT-941464; *TCG Seattle and Digital Direct of Seattle, Inc., v. U S WEST Communications, Inc.*, Docket No. UT-941465; *TCG Seattle v. GTE Northwest Incorporated*, Docket No. UT-950146; and *Electric Lightwave, Inc. v. GTE Northwest Incorporated*, Docket No. UT-950265

## II. INTRODUCTION

2. On February 8, 1996, the President of the United States signed into law the Telecommunications Act of 1996 (Act). This law promotes development of competition in the telecommunications industry, particularly in the provision of local exchange services. The Act requires all states to allow competition in previously protected local exchange markets. As part of this process, each state regulatory commission must develop pro-competition rules in accordance with the guidelines that are established by the Federal Communications Commission (FCC).

3. Pursuant to Section 252(b)(1) of the Act, if the parties to an interconnection arrangement are unable to reach agreement on the terms and conditions for interconnection, a requesting carrier may petition its state regulatory commission to arbitrate any unresolved issues by voluntary negotiation. A number of companies were unable to reach complete agreement with U S WEST and GTE, and exercised their right to arbitration, pursuant to Section 252(b)(1) of the Act. In those arbitration proceedings, the Commission established interim prices for interconnection, unbundled network elements, transport and termination, and the wholesale avoided cost discount pending this cost and pricing proceeding. The prices resulting from Phase II of this proceeding will replace those interim prices.

4. This proceeding is conducted essentially under our statutory authority to set prices for interconnection, collocation, unbundled network elements, and resale. The permanent costing and pricing decisions which result from this proceeding, however, also must comport with the applicable cost and pricing standards set forth in the Act.

5. Just and reasonable rates for interconnection<sup>8</sup> and unbundled network elements are to be based upon the cost of providing interconnection or the network element. The cost is to be determined without reference to a rate-of-return or other rate-based proceeding. The prices established may include a reasonable profit. 47 U.S.C. § 252(d)(1)(A).

6. Charges for the transport and termination of traffic are to be on a reciprocal compensation basis, the terms and conditions of which are to be just and reasonable. 47 U.S.C. § 251(b)(5). Just and reasonable terms and conditions allow each carrier to recover the costs associated with the transport and termination of calls that originate on another carrier's network. §252(d)(2)(A). The terms and conditions

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<sup>8</sup> The term 'network element' means a facility or equipment used in the provision of a telecommunications service. Such term also includes features, functions, and capabilities that are provided by means of such facility or equipment, including subscriber numbers, databases, signaling systems, and information sufficient for billing and collection, or used in the transmission, routing, or other provision of a telecommunications service. 47 U.S.C. §153.

must determine the costs on the basis of a reasonable approximation of the additional costs of terminating such calls.

7. The costing (and pricing) standard for establishing a wholesale discount pursuant to the Act is contained in Section 252(d)(3): “[f]or the purposes of section 251(c)(4), a State commission shall determine wholesale rates on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier.”

8. With regard to collocation<sup>9</sup>, local exchange companies are required to provide “rates, terms, and conditions that are just, reasonable, and nondiscriminatory.” §251(c)(6).

9. The FCC’s Interconnection Order provides guidance on many costing and pricing issues, but its recommendations are largely non-binding. *Iowa Utilities Board v. FCC*, 120 F.3d 753 (8th Cir. 1997). The FCC has provided valuable guidance for the costing of unbundled network elements. In its Order, the FCC stated that total element long-run incremental cost (TELRIC) should be used to estimate the cost of unbundled network elements. The analysis is explained in paragraphs 674-740 of the FCC’s Order. All parties in this case advocate the TELRIC methodology as the appropriate costing analysis. U S WEST Brief at 4.

10. The TELRIC methodology 1) assumes the use of best available technology within the limits of existing network facilities; 2) makes realistic assumptions about capacity utilization rates, spare capacity, field conditions, and fill factors; 3) employs a forward-looking, risk-adjusted cost of capital; 4) uses economic depreciation rates for capital recovery; and 5) properly attributes indirect expenses to network elements on a cost-causative basis. See, for example, FCC Interconnection Order ¶¶674-703; Exh. 1 at 21-39; Exh. 112 at 12.

11. By following these cost principles, a cost floor that reflects the prospective economic costs incurred by an efficient supplier is established for each network element. In Phase II of this proceeding, the cost will be used to set the price for the network element. Historically, the justness and reasonableness of regulated rates has been judged, in part, with reference to the cost-of-service. Martin G. Glaeser, Public Utilities in American Capitalism (New York: Macmillan Company, 1957), p.196.

12. Economic efficiency dictates that the cost floor be established in a manner

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<sup>9</sup> Physical collocation allows competitive service providers and end-users to terminate their own special access and switched transport access transmission facilities at a LECs’ central offices, with the interconnecting party the LEC for central office floor space. Virtual collocation allows interconnectors to designate central office transmission equipment to be dedicated to their use, as well as to monitor and control their circuits terminating in the LEC central office. These interconnectors do not pay for the LECs’ floor space and have no right to enter the LEC central office.



which maximizes society's welfare and is consistent with the Act's requirement that the rates be just and reasonable. We will set prices for unbundled network elements in Phase II of this proceeding. Setting economically efficient prices will provide the right signal to competitive local exchange carriers (CLECs). Most importantly, it will help them in making their decision either to construct their own network or to lease facilities from the incumbent local exchange carrier (ILEC). If the price of an unbundled network element is set too high, a CLEC may build facilities when society's scarce resources would be better employed if it had rented facilities from the ILEC. On the other hand, if the price of unbundled network elements is set too low, a CLEC may rent facilities from an ILEC rather than build. This would reduce society's well-being, because the least cost supplier is not the one who is building and maintaining the network facilities. In order to maximize society's welfare, resources should be directed toward the supplier that can construct a network at the lowest cost to society. Exh. 1 at 22.

13. The local loop is the most difficult facility for any potential competitive local exchange carrier to replicate. For this reason, the parties' evaluation of the competing cost models has focused on the cost estimates generated for the local loop. U S WEST uses its Regional Loop Cost Analysis Program ("RLCAP") as the basis for generating the costs it estimates for the local loop. The estimated costs for all unbundled network elements propounded AT&T/MCI were generated by the Hatfield Model. Sprint recommends that the Benchmark Cost Proxy Model (BCPM) be used to estimate the cost of the loop. GTE uses its loop technology model (LTM).

14. The evaluation of any model involves two important steps. First, do the algorithms (formulas) adequately capture the salient cost characteristics of the network? As Commission Staff has pointed out, an analytical model is a simplified representation of some aspect of the real world. Analysts use models to organize the complexity of the real world into some orderly form. Commission Staff Brief at 6. In our comparison of the different models, we consider, among other factors, the degree to which each model's cost algorithms accurately estimate the economic impact of the primary cost drivers in a network.

15. After the algorithms are established, values must be set as inputs for the cost models. While considerable attention has been given to the reasonableness of the different models' algorithms, the parties have spent the majority of their time presenting evidence on the reasonableness of the inputs to the various models. See, for example, Exhs. 48, 53, and 162. Their efforts are reflected in our findings *infra*. While we spend some time discussing the reasonableness of the different models' algorithms, most of the discussion concerning the cost of the loop focuses on what constitutes reasonable input values for the different models. The cost estimates generated by the parties' cost studies tend to converge when the same inputs are used in the various models. See, for example, Exhs. 48 and 162.

16. The second primary issue in this proceeding is the wholesale discount

provided pursuant to Section 252(d)(3). The Act requires that telecommunications services be made available for resale at a discount which reflects costs that are avoided in a wholesale environment. §251(c)(4). Here, too, guidance is provided by the FCC Interconnection Order; however, as with the costing and pricing of unbundled network elements, the FCC's findings are not binding.

17. Finally, the FCC recommends that state regulatory commissions identify costs that are directly avoided when the ILEC is no longer the contact point for retail customers. These directly avoided costs are then "loaded" for expenses that are indirectly related to the provision of retail services. For example, in a wholesale environment, the ILEC may no longer bill end-users. This results in a reduction of direct costs, such as postage, as well as indirectly related costs, such as the computer system which is used for retail billing. The directly and indirectly avoided costs are used to determine the avoided cost discount.

### III. COST METHODOLOGY: PRINCIPLES

18. The objective of Phase I of this proceeding is to establish costing procedures and cost levels for unbundled network elements, interconnection, transport and termination, physical and virtual collocation, and the resale of telecommunications services. In addition, we must establish the cost of interim local number portability. In Phase II of this proceeding, we will establish prices for unbundled network elements and the price for wholesale telecommunications services. These pricing and costing procedures will be used for U S WEST and GTE.<sup>10</sup>

19. We previously have observed the importance of establishing appropriate costing and pricing levels: "For consumers to have competitive choice, the U S WEST network must be opened up at terms that are fair to both U S WEST and new entrants. A key part of that process is determining the costs and prices for U S WEST's services." Fifteenth Supplemental Order, Docket No. UT-950200 (April 11, 1996), at 9.

20. The costs for unbundled network elements established in Phase I of this proceeding will serve as the price floor for network elements. Although, as Commission Staff notes, this does not apply to all cost determinations, *e.g.*, the cost of interim number portability. Commission Staff Brief at 6. In Phase II of this proceeding, we will determine the extent to which there should be uniform or varying "mark-ups" for different network elements.

21. Phase I has focused on the analytical models used to estimate the cost of unbundled network elements and wholesale discounts. As the Commission Staff has noted, an analytical model is a simplified representation of some aspect of the real

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<sup>10</sup> GTE also urges the Commission to address implementation costs, universal service support costs, and stranded costs. GTE Brief at 7.

world. Analysts use models to organize the complexity of the real world into some orderly form. Models are, by definition, simplifications or abstractions which omit some information. A model can be a very powerful analytical tool. It can act as a microscope or a telescope which may enable the analyst to focus in on the key aspects of a situation and thereby to solve problems that, in the absence of a model, would be hopelessly complex. Commission Staff Brief at 6.

22. The analytical models on the record in this case are computer models designed or used to estimate the cost of constructing and operating the public-switched telephone network. That network is exceedingly involved and complex. It encompasses millions of access lines and hundreds of switches, interoffice transmission facilities, signaling links, and other elements. Cost models are used to sort through the complexity of that network. They help to organize it into similar elements that have similar costs, and to estimate the cost of those elements. These cost models lend themselves to two basic purposes. First, they can be used to measure the cost that would be incurred should it be necessary to reconstruct the network under certain specified conditions, such as the "scorched node" assumption. Second, they can be used to disaggregate the otherwise undifferentiated costs of the network into various element costs, so that the price of a loop can be separated from the price of a switch, and the cost of a 10,000-foot loop in an exchange of a certain size can be separated from the cost of a 10,000-foot loop in an exchange of different size. In other words, one might use a model to estimate what it would cost to build a portion of the network or to rebuild the entire network. *Id.* at 7.

23. The parties basically agree that the cost levels established in Phase I should be based upon open, reliable, and economically sound cost models and cost inputs. See, for example, AT&T Brief at 9-10; Sprint Brief at 9-10; Commission Staff Brief at 11; TRACER Brief at 11. There is also basic agreement that costing should be performed in sufficient detail so that the resulting prices would lead to economically rational entry decisions by competitors, as well as efficient utilization of the incumbent local exchange company's network. Sprint Brief at 6. Such a policy would ensure that prices are set neither too high nor too low, which would best serve the public interest. (Exh. 152 at 4). We concur with the parties regarding the criteria for this costing exercise, but we note that there is disagreement among the parties over the degree to which the filed cost studies satisfy these criteria.

24. We believe that an open<sup>11</sup> model is in the public interest in that it provides

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<sup>11</sup> We have on other occasions defined what we mean by an open cost model:

The Commission has on numerous occasions, most recently in the "term loops" order, expressed its frustration with its inability to penetrate U S WEST's calculation of costs . . . the Commission will require a transparent, rational, stable, consistent, and understandable approach,

all parties with an opportunity to fully explore the advantages and the limitations of the different cost models. Furthermore, we believe that models should be open in order for the public to have the opportunity to evaluate the information which is used to set rates. Fifteenth Supplemental Order, Docket No. UT-950200 (April 11, 1996), at 86; Fourth Supplemental Order, Docket No. UT-941464 *et al.* (October 31, 1995), at 93 (Interconnection cases).

25. An open or transparent model would provide an interested person with the opportunity to review both the compiled and uncompiled source codes. Furthermore, support for input values, and a narrative description of how the model operates, should be available. In addition, the model should be susceptible to modification and sensitivity analysis. Ninth Supplemental Order, Docket No. UT-950200 (October 19, 1995), at 2.

26. None of the models filed in this proceeding fully meet our criteria for openness. At one extreme we have the Bellcore Models. These models are largely closed. Bellcore has placed restrictions on access to and review of its models. *Seventh Supplemental Order - Supplemental Protective Order*, Docket Nos. UT-960369, *et al.* (July 11, 1997). The Hatfield and the Benchmark Cost Proxy Models (HM and BCPM, respectively), on the other hand, come the closest to being open models. While the cost algorithms are largely transparent, both proxy models use data that are not in the public domain. Consequently, they are difficult to audit. For example, the Hatfield Model uses data that have been collected and processed by PNR. Neither the raw data nor the processing algorithms have been made available. The sponsors of BCPM have collected cost input data from incumbent local exchange companies and have not placed the survey responses in the public record.

27. In judging the soundness of the cost inputs, we believe that U S WEST has proposed a useful standard: the inputs “must be *realistic, accurate estimates* of all of the *actual* costs a provider would incur if it built out a new network using the least cost, forward-looking technology.” U S WEST Brief at 5.

28. The parties concur that a cost model should be used to estimate the

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that will continue to be viable and applicable in determining costs for services in the foreseeable future . . . to allow parties to proceedings involving cost issues to have the ability to understand assumptions used, to review and analyze the effect of inputs and outputs, and to modify and model different inputs and assumptions.

Ninth Supplemental Order, Docket No. UT-950200 (October 19, 1995), at 2.

forward-looking cost of a network element. Furthermore, most parties agree that the cost estimates for unbundled network elements should be based upon the cost of satisfying the total demand for the elements, rather than some smaller level of incremental demand. See, for example, AT&T Brief at 12, 14-15; Tr. 1007; U S WEST Brief at 14; Sprint Brief at 11.

29. WITA witness Meitzen argues that the cost estimates should not be based upon total demand. Rather, Meitzen claims that the cost models should measure the cost of satisfying some smaller level of incremental demand. Meitzen argues that using a lower level of demand better reflects the costs that local exchange companies would incur while satisfying the demand for unbundled network elements. Exh. 100 at 12; Exh. 100, MEM-2 at 6-10.

30. WITA believes that a firm's actual costs should be measured by a cost model, because these are the expenditures that must be reflected in the market price for unbundled network elements. In a competitive market, the costs incurred by an efficient supplier, not an inefficient firm, determine the market price. WITA Brief at 13; Tr. 1461-63.

31. WITA did not sponsor a cost model. Instead, it supported the adoption of both the U S WEST and GTE cost models. WITA Brief at 8. Paradoxically, both of these companies have used total demand to estimate the cost of unbundled network elements.

32. A forward-looking cost model does not measure the embedded cost-of-service. Sprint Brief at 9. The model should estimate the economic or prospective costs of providing services or elements. Fifteenth Supplemental Order, Docket No. UT-950200 (April 11, 1996), at 80; FCC Interconnection Order at ¶¶ 704-707.

33. As Sprint points out, forward-looking cost measurements require capturing the future costs of network facilities. The use of current wire center locations, along with the most efficient technology available to determine forward-looking economic costs, is the approach that most reasonably balances the interests of ILECs, CLECs, and consumers. ILECs need prices that will recover their forward-looking economic costs. CLECs need to be provided with the opportunity to compete on an equitable basis with the ILEC. Consumers benefit most when there is facility-based competition. Sprint Brief at 15-16. See, also, Commission Staff Brief at 13.

34. GTE argues that "[t]he most important and overriding criteria for any cost model is that it is accurate and has been validated." It adds that transparency and ease of use are not sufficient conditions for accepting a model. The integrity of a model is best determined by the degree to which its inputs and outputs are shown to be accurate. GTE Brief at 7.

35. Based upon the evidence presented in this case, we conclude that none

of the current versions of the models should be adopted for use in future proceedings. All of the models are going through an evolutionary process. Consequently, it would serve no purpose to adopt versions of the models presented in this proceeding as a Commission "sanctioned" model. Rather, as suggested by U S WEST, we believe that the models filed in this proceeding should be used to establish a reasonable range of costs that can be used as the basis for setting prices in Phase II. U S WEST Brief at 6-7.

36. Our decision not to endorse a particular model should not be interpreted as a reversal of policies adopted in recent cases. Specifically, we continue our endorsement of open models. The two loop proxy models, BCPM and HM, allow parties to closely review the algorithms without being subject to the constraint of restrictive proprietary agreements. We believe that open models allow for a fuller discussion of each model's advantages and disadvantages. For this reason, we believe that, to the greatest extent possible, models presented to the Commission in future proceedings should be open.

37. We concur with GTE that the inputs to the cost models need to be validated. We agree, in part, with GTE's position that model outputs need to be validated. For some cost elements, it is possible to validate the outputs. For example, periodically new switching machines are acquired which provide service to an entire wire center. When such an acquisition is made, facilities are installed to satisfy total demand. Hence, the amount recently paid for a new switch provides a good metric of the prospective economic cost of a switching machine. But for the loop, neither GTE nor any other party has provided a useful method for validating the loop investment estimates. See, for example, Tr. 940-944. Validation for the loop models is more difficult, because often facilities are installed to satisfy a portion of the demand, rather than the total demand in a wire center. Consequently, the costs incurred do not correspond to the expenditures required to satisfy the total demand for loops.<sup>12</sup>

38. Economic cost models provide a useful analytical tool for evaluating the reasonableness of rates. The models presented in this proceeding were designed to estimate the total element long-run incremental cost (TELRIC). We agree that this is the correct costing standard, and that the cost estimates should be based upon the cost of satisfying the total demand for elements rather than some lesser level of incremental demand. We find, however, that none of the models satisfies the Commission's objective of being open, reliable, and economically sound. Therefore, while some parties argue that a cost model should be adopted by this Commission, we decline to do so at this time, for the reasons fully described in this section.

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<sup>12</sup> U S WEST did present information from its broadband experiment in Omaha, Nebraska. We concur with AT&T witness Fassett that the experience from this broadband trial does not provide a basis for modeling the construction cost of telecommunications outside plant. Exh. 6 at 8-9; Exh. 130 at 3, 38-39.

#### **IV. TRANSITION COSTS**

39. The Act requires ILECs to modify their networks so that CLECs may obtain such items as unbundled network elements and wholesale services through operational support systems (OSS). ILECs claim that the Act has compelled them to pay for unplanned network upgrades. The term “transition costs” is used to characterize any expenditures that ILECs make to their networks in order to comply with the statutory requirements of the Act. Second Supplemental Order, Docket No. UT-970010 (November 7, 1997). AT&T argues that “transition costs are not an appropriate part of TELRIC (*i.e.*, the costs of unbundling) because in a genuine TELRIC environment, the network would already be designed to provide unbundled network elements.” AT&T Brief at 18, citing Exh. 1 at 37.

40. In this Order, we do not rule on all issues related to the recovery of transition costs. Instead, we have reserved our findings on certain topics until this matter is more fully explored during Phase II of this proceeding. Nevertheless, we do find certain areas in which ILECS are entitled to compensation for their transition costs. For example, when a local exchange company must incur costs to separate unbundled loops from retail loops through the use of AD4 channel banks, the cost of this grooming should be included in the TELRIC of a loop.

41. The Commission will consider the recovery of transition costs in Phase II of this proceeding. Second Supplemental Order, Docket No. UT-970010 (November 7, 1997), at 9. In Phase II, parties are ordered to provide testimony on both the level of transition costs and the appropriate cost recovery mechanism. We request also that the parties address the reasonableness of the proposed customer transfer cost studies.<sup>13</sup> We have postponed our evaluation of the customer transfer cost studies for manual intervention rate, which will be considered simultaneously with our evaluation of nonrecurring expenses related to the transition to competition through resale.

#### **V. COST OF THE LOOP**

##### **A. Outside Plant Placement Costs and Structure Sharing**

42. Much of the testimony in this case focused on the cost of providing a loop. Parties disagreed about such issues as the appropriate level of inputs, model algorithmic errors, the ability of the model to properly identify customers’ locations, and network design. We begin our evaluation of loop costs with an analysis of the testimony on outside plant placement costs and structure sharing.

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<sup>13</sup>The customer transfer cost studies identify the cost of transferring an existing customer/account to a local exchange service reseller.

## 1. U S WEST Placement Costs and Sharing

43. Placement costs are the costs to install outside plant facilities. The cost of placing facilities is affected by the extent to which these costs are shared with other utilities. For example, if electric, cable television, and telephone cables are placed in the same trench, the cost of opening up the ground would be shared by the different utilities. This sharing would reduce the cost of placing telephone cables.

44. U S WEST's cost model, RLCAP, presumes that the cost of installations falls into one of two categories -- easy or difficult. Installation conditions are considered "easy" when the trenching is handled by a building developer.

45. U S WEST's RLCAP model uses as an input the cost of different activities. The cost of these activities is based upon data derived from contracts with different construction companies. The mix of these activities is based upon the judgment of U S WEST engineers. U S WEST assumes that where buried cable is installed in developed residential areas, 50% of the cable sheath is installed through boring. While other types of installation processes are utilized elsewhere, the Company is effectively assuming that approximately 21% of sheath footage is installed through boring. Exh. 114 at 12; Tr. 1965.

46. U S WEST's assumption that boring would be used widely in Washington is based, in part, upon the Company's experience with constructing a broadband network in Omaha, Nebraska. U S WEST witness Harris claimed that "[t]he outside plant placement which occurred in the Omaha trial . . . was very similar to many of the costs which would be incurred in reconstructing a local exchange network according to the FCC's TELRIC rules." Exh. 113 at 17.

47. U S WEST has emphasized the need to take into account existing obstacles such as sidewalks, driveways, and gardens. In order not to damage these structures, the cost of installing plant in developed areas is increased. Exh. 114 at 13; Exh. 112 at 26.

48. Where structures exist which would reduce the cost of installing facilities, such as conduit beneath streets, the Company states that the existence of these facilities should be ignored. *Id.* at 62-63. We find these two positions to be inconsistent and to have the effect of overstating the cost of installing a loop.

49. Both the BCPM and RLCAP models require the analyst to assume the "proper" mix of such activities as boring, trenching, and plowing. U S WEST Brief at 46. Both models estimate the per foot cost of installing facilities by multiplying the cost of different activities by the likelihood that this installation procedure will be employed. These products are then summed in order to obtain the weighted cost of installing cables. Depending upon the mix of activities selected, the weighted cost per foot of



installing cables can vary substantially.

50. U S WEST is a sponsor of the RLCAP in this proceeding, but has advocated the adoption of BCM2 and BCPM in FCC and other state regulatory proceedings. Exh. 83, attachment 1, at 3; Exh. 84 at 9; Exh. 114 at 36. These three models, variously sponsored by the same Company, exhibit great variance in the claimed “proper” mix of activities. In this proceeding, U S WEST is claiming that bore cable is used 50% of the time when buried cable is installed in developed areas. BCPM, a model for which it is a co-sponsor, uses an input value of approximately two percent. Exh. 114 at 12; and Exh. 83 at 20, 36.

51. The BCPM “mix of activities” was selected by a group of local exchange engineers. Tr. 1282-84.

52. U S WEST witness Reynolds argues that his Company’s engineering group has verified that the costs for different activities are reasonable. Exh. 117 at 16. The cost of the activities may be reasonable, but the Company has provided data on the mix of activities which are inconsistent between studies and relative to the deposition of its field engineering operations.

53. A manager of U S WEST’s field engineering operations, Genie Cervarich, testifies that the Company employs bore cable, as opposed to burying or plowing, for approximately one percent of the buried plant installations in Washington. Exh. 130 at 4, 38-39.

54. AT&T/MCI claims that bore cable is used in urban areas for approximately 10%-15% of installations. Based upon the information provided by AT&T witness Fassett, and a deposition that pertains to U S WEST’s operations in Arizona, AT&T/MCI witness Zepp recommends that “a conservatively high estimate for boring cable in difficult areas is 20%.” Exh. 162 at 19.

55. Based upon the evidence of record in this proceeding, we determine for purposes of the RLCAP model that five percent of the buried cable installations in developed areas require bore cable. This value is slightly higher than the value suggested by the deposition of U S WEST’s field engineer and the inputs to the BCPM.<sup>14</sup> The deposition of U S WEST’s field engineer Cervarich clearly indicates that the Company’s experiment with broadband technology in Omaha is a poor barometer of the type of installation techniques used in Washington State.

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<sup>14</sup> We are unable to vary the likelihood of bore cable by density zone because the RLCAP model uses the same placement cost assumption in all areas of Washington State.

56. RLCAP assumes that U S WEST will bear 100% of the cable placement costs for underground and 82% if it needs to be buried. Exh. 117 at 19. The Company claimed that these values reflect “the present and forward-looking reality that developers provide the trench in new developments for buried facilities and accounts for the fact that U S WEST incurs no trenching cost for developer-provided trench.” To support its position, U S WEST cited the deposition of its field engineer, Genie Cervarich. U S WEST Brief at 40-41.

57. The deposition of U S WEST’s field engineer Cervarich is not supportive of the Company’s argument. Cervarich testified that outside of the downtown core area, the placement cost of underground conduit is shared with other utilities. Exh. 130 at 91. Furthermore, when a total rebuild occurs in a developed area, the likelihood of a joint undertaking with another utility increases significantly. Cervarich testified that city officials encourage utilities to coordinate their work in developed areas. Exh. 130 at 87-88.

58. U S WEST’s position that it will bear 100% of the placement costs for underground work is also contradicted by the deposition of MCI employee Mark Wingate. Wingate is the manager for MCI’s outside plant engineering and construction in Washington State. He supervised the construction of MCI’s outside plant facilities which provide loops to customers in this state. Mr. Wingate’s testimony illustrated that when a new network is constructed, there is extensive sharing with other service providers. This sharing has occurred in developed areas and it involves the sharing of both aerial and underground structures. Among other providers, MCI has shared facilities with U S WEST. Exh. C-3 at 9, 29, 41-45, 59-68, and, Deposition. Mr. Wingate’s testimony provides strong support for the proposition that in urban areas the structural cost of laying conduit would be shared by various service providers.

59. U S WEST also argues that it is inappropriate for the Hatfield Model sponsors to assume that sharing will occur between telecommunications providers, while at the same time presuming that the incumbent supplier will retain 100% of the market. When a cost model assumes that the incumbent will continue to serve 100% of the market, all else being equal, the cost of a loop is reduced. U S WEST Brief at 43.

60. We agree with U S WEST that, theoretically, a loss in market share would be reflected in the estimate of the economic cost of the loop. We note though that U S WEST has not presented evidence showing that it will not be realizing the economies of scale assumed in the Hatfield Model. Furthermore, U S WEST’s own cost modeling effort implicitly assumes that the number of lines it will be serving would increase due to the growing demand of customers for additional lines. Exh. 117 at 39.

61. The record suggests that more competition has occurred in urban than in suburban or rural areas. Exh. C-3. To the extent that rivalry increases the unit cost of production, the cost impact would be felt almost exclusively in the more densely populated markets. Whereas none of the models permit us to directly estimate the cost impact of market share losses in more densely populated markets, we encourage parties to address how this shortcoming in the models should be reflected in setting the prices of unbundled network elements. Furthermore, in deriving our loop costs for GTE and U S WEST, we have been mindful that a drop in market share raises the unit cost. The impact of a decline in installed loops is illustrated by our findings on special access lines, *infra*, at paragraph 204. This discussion suggests only that a decline in the number of loops does have an impact on the unit cost of production.

62. RLCAP assumes that U S WEST will bear 82% of the placement cost for buried cable. This 82% represents developed areas in which U S WEST would have to bear the entire expense of burying cable in the coming five years. Exh. 114 at 12. The assumption made in the cost study that there would be no sharing in developed areas is contrary to the Company's practices as described by Cervarich.

63. We have modified the assumption made in RLCAP that there would be no sharing in developed areas. In developed areas, we have determined that seven percent of the buried placement cost is shared with other utilities. For underground conduit, we have determined that 15% of the cost is born by others. These sharing values for developed areas, when considered along with the areas in which the building developer incurs the placement costs, result in a level of sharing that falls in the range adopted, *infra*, at paragraph 76, for the Hatfield and Benchmark Cost Proxy Models.

64. GTE's loop model does not include any underground conduit or buried cable structure sharing. Tr. 1088-1092. GTE's cost analyst made this assumption without investigating the extent to which these facilities would be shared with other utilities in new developments. Tr. 1091. The assumption of zero structural sharing is contrary to the testimony provided by U S WEST witness Cervarich, MCI employee Wingate, and our understanding of telephone operations in Washington State.

65. GTE argues that the assumption of zero sharing for buried cable is reasonable because "[s]afety concerns prohibit virtually all sharing of buried cable with an electric cable[,]" adding that when cable is plowed, sharing rarely, if ever, occurs. GTE Brief at 54.

66. The evidence in this proceeding is that electric cables are placed in the same trench as telephone cables. For example, in new housing developments, it is not uncommon for multiple utilities to share the same trench. Furthermore, AT&T/MCI witness Fassett points out that due to changes in construction practices, telephone companies are placing feeder cables in the same trenches as power company facilities. Tr. 326. In addition, GTE has not explained why its trenches could not be shared with

other utilities, such as cable television providers.

67. GTE argues that it was appropriate to assume no sharing of conduit because historically it has infrequently shared conduit, and because its cost model assumes a minimally sized conduit system. GTE witness Tucek speculated that if the size of the conduit system was increased to permit sharing, the unit costs would increase. Tr. 1088; GTE Brief at 54-55. We find Mr. Tucek's speculation to be contrary to the experience reported by one competitive local exchange carrier. Exh. C-3. Furthermore, if the cost of a shared conduit system was more expensive than a stand-alone system, we would expect not to observe such strong interest by the CLECs in sharing facilities with the ILECs. In order to promote rivalry, Congress required that ILECs provide access to their ducts and conduits. 47 U.S.C. §251(b)(4).

68. The GTE loop model does not provide the user with the flexibility to alter the assumption of zero structural sharing for underground conduit or buried cable. Based upon our finding, *infra*, at paragraph 76, this lack of flexibility results in an overstatement of loop costs. In our findings regarding loop costs, we will take this cost impact into account.

69. The Hatfield Model assumes that incumbent local exchange carriers would pay only one-third of the cable placement costs which would be required to reconstruct an efficient network. The Hatfield sponsors contend that while this level of sharing has not occurred in the past, competitive market pressures would compel the ILECs to seek methods for reducing their construction costs. AT&T/MCI Brief at 45-46.

70. GTE conducted a study of the extent to which it shares pole costs with electric utilities and cable television providers. A study of its operations in Washington State found that it bears 44.5% of the total cost associated with poles. GTE does not expect the extent of sharing to increase in the foreseeable future. GTE Brief at 52-53.

71. GTE's recommended 44.5% cost assignment for poles is not unlike the 50% value recommended by U S WEST. Exh. 114 at 46.

72. GTE states that the current rate of pole structure sharing "belies" the claim of the Hatfield sponsors that under rate base regulation, ILECs "had little incentive to share their outside plant structure with other users." *Id.* at 53, citing Exh. 40, RAM-3, Appendix A.

73. Commission Staff contends that the historical rate of sharing did not result in providers minimizing their production costs. They cautioned though that the degree of sharing that takes place is constrained by the "difficulty coordinating joint facility work." Staff proposes a range for sharing "which reflects the balance between maximum achievable structure sharing and the amount of structure sharing achieved historically." Staff's proposal is also designed to reflect that opportunities for sharing would be fewer in low density areas. Exh. 104 at 8-9.

74. WITA does not agree with Commission Staff's recommendations. WITA believes that the recommended values reflect too much guess work and not a sufficient amount of "real-life experience." WITA Brief at 19.

75. TCG argues that minimal sharing assumptions should not be adopted because such values are not pro-competitive: "Imposing prices on competitors that effectively reimburse ILECs for their costs of refusing to share placement would provide additional incentive to engage in anticompetitive behavior." TCG Brief at 21.

76. For the Hatfield and BCPM scenarios we run in this proceeding, we have adopted the sharing assumptions recommended by Commission Staff. Exh. 104, TLS-3, at 4. We note that these values do not consistently fall below or above the recommendations of the ILECs. For example, both GTE and U S WEST recommend a higher degree of sharing for aerial poles in rural areas than does Staff. On the other hand, both ILECs recommend less buried and underground structure sharing.

## **2. GTE Placement Costs**

77. The BCPM, HM, and RLCAP models use as an input the "cost-per-foot" of installing different types of cable. The GTE loop technology model (LTM), on the other hand, begins with the number of hours required to install a cable. It uses this input, along with the hourly labor rate, to determine the model's "cost-per-foot" of placing the cable. Tr. 1322; Exh. C-91.

78. Like RLCAP, but unlike BCPM and HM, GTE's LTM is not an integrated model. A user of the model would have to run a number of separate modules in order to establish the cost of a loop. For example, a fundamental input to GTE's loop model is the cost-per-foot of placing cable. The cost-per-foot for different density zones is calculated in separate computer modules. All of the results must be imported into a spreadsheet and summed, in order to obtain an estimate of the cost of a loop. See, for example, Exhibit 65, WATELRIC.XLS folder Lp\_InvCost, cell E41 and Folder Loop Cost E41, and Exhibit CC-32 at 14.

79. This lack of integration makes it relatively more difficult to audit or use LTM than BCPM or the HM. Exh. 31 at 50. Furthermore, since the GTE summary spreadsheet contains the cost-per-foot within a distance band, and not the investment per foot, it is harder to compare the GTE inputs with the input values used in the other models. Data on cost-per-foot are more difficult to validate because the input is of a different form than appears in the other models, and because construction contracts

are stated as an investment value, rather than an annual cost. See, for example, Exh. CC-10.

80. No party suggests any changes to the input values for the GTE placement costs. Therefore, we have made no modifications to these inputs in evidence on this record.

### **3. BCPM Placement Costs**

81. The BCPM provides an integrated module to develop structure costs for aerial, buried, and underground installations by density group and terrain difficulty. A local exchange industry group provided most of the default input values for the model, including the cost and likelihood of different placement activities. The BCPM user can vary cost of installation activities, such as plowing, as well as alter the percentage of a construction activity by density zone. In addition, the user can change the amount of an activity that can be shared between utilities, such as the placing of poles. Exh. 83 at 10-11; Exh. 84 at 4; Exh. 90 at 6.

82. AT&T/MCI argue that the placement cost inputs to the BCPM are unreasonable, but do not propose any changes. AT&T/MCI claim that it would be difficult to modify the inputs because their values were developed through a survey. This survey was not produced by the BCPM developers and, therefore, "there is no way . . . to determine how these overstatements were introduced into BCPM." Exh. 31 at 56.

83. As with the GTE model, we have made no adjustments to the BCPM input values in evidence on this record because no party has suggested the adoption of alternative values. We do note, however, that we find troublesome the method used to develop the BCPM inputs. The input values are based upon a proprietary survey that was not made available to other parties. Furthermore, the mix of activities is based upon the opinion of an industry group. As our discussion of the RLCAP placement costs illustrates, there is a considerable difference of opinion as to what constitutes an appropriate mix of activities. We believe that the parties should have provided evidence from recent installations as support for their claimed costs. The presentation of this type of data would help illuminate the question of the appropriate mix of activities associated with cable installations.

84. U S WEST argues that data from recent installations "may not be the best and most accurate predictor of a forward-looking network, because placement activity in the present environment is mostly relative to adding new facilities in undeveloped areas." U S WEST Brief at 46. We disagree. We believe that there should be sufficient evidence in the ILECs' and CLECs' accounting records, or from other

sources, such as the Rural Utilities Service, to indicate the cost of replacing or reinforcing plant in developed areas.

#### **4. Hatfield Model Placement Costs**

85. The Hatfield Model's placement costs were developed by a team of engineers who collected information from outside plant contractors. The cost of installing the plant increases with the population density.

86. Hatfield Model version 3.1 uses a different classification of density zones than the prior version of the model. This change causes a large decrease in the cost of placing facilities in the 2,500-5,000 access line density zone. U S WEST argues that the higher Hatfield Model version 2.2.2 input values should be used in this case. U S WEST Brief at 46-47.

U S WEST's objection is similar in form to a criticism that was made of an important input to one of U S WEST's loop models. In this proceeding, U S WEST changed its assumed mix of difficult and easy terrain installations compared to a recent cost study filed with this Commission. This modification resulted in an increase in the estimated cost of a loop. Public Counsel and TRACER believe that the value from the earlier study should be used in this proceeding. TRACER Brief at 23; Public Counsel Brief at 10-12. We find that simply because an input was used in a prior proceeding does not prove conclusively that the original value was correct. Rather, the party proposing a particular input to a cost model bears the burden of proving that the input value is both appropriate and reasonable.

87. Commission Staff compared the engineered, furnished, and installed (EF&I) cable costs for the different models. The average EF&I cable cost inputs found in the ILEC models were higher than in the Hatfield Model for smaller cables and lower for larger cables. Staff proposed that the average ILEC's costs be used as inputs to the Hatfield Model. Staff Brief at 24-25; Exh. 104 at 10.

88. We do not adopt Commission Staff's proposed inputs, because we find that the values are not consistent with Staff's recommended sharing values. The data extracted from U S WEST's loop model are based upon plowing the cable into the ground, a mode of installation in which sharing is less likely to occur than with trenching. Tr. 1699-1706. If sharing of the magnitude recommended by Commission Staff is to take place, we believe that most buried cable would be placed in trenches.

89. GTE objects to the manner in which the Hatfield survey data were used. For example, GTE witness Murphy pointed out that when information was collected on the cost of installing buried drop wires, the Hatfield team excluded some of the higher price quotations. Exh. CC-54 at 7-8.

90. AT&T/MCI responds that it was appropriate to exclude the more expensive vendor prices:

Average prices were certainly not used as the default values in the Hatfield Model 3.1. In a TELRIC, or a competitive business environment, it would not be appropriate to use averages as the default values. Whenever contracts are awarded as a result of the competitive bid process, the bidder with the lowest cost proposal that meets the requirements is awarded the contract.

Exh. 8 at 6, 8.

91. Mr. Fassett, AT&T's outside plant expert, added that the vendor price data were used to validate his and other experts' opinions. *Id.* at 4, 10, 15.

92. GTE recommends against calculating inputs from the total survey data collected by the Hatfield engineering team. To add the excluded data points would not allay all of GTE's concerns. GTE witness Murphy stated that since the sample data might not be valid, the averages calculated from the data might be incorrect. GTE does not propose the adoption of alternative input values that could be used in the Hatfield Model. Exh. CC-54 at 27-28.

93. The Commission agrees with GTE that the method used by AT&T to collect data from vendors was flawed. A questionnaire was sent to vendors asking the cost of installing cables in different soil, bedrock, and density conditions. See, *e.g.*, Exh. CC-54, Attachment A, Bates GHATF000262-GHATF00265 and GHATF000277-GHATF000305; Exh. CC-10. The AT&T questionnaire did not define the terms used in the questionnaire. Therefore, one contractor's estimates could be higher than another due, for example, to a different perception of what constitutes rocky soil. Also, the contractors who responded to the questionnaire could have differing views as to which line or household density bands constitute rural, suburban, or urban conditions. This varying perception of soil conditions and density could account for some of the variation in the data supplied by the vendors.

94. AT&T/MCI argue that it was appropriate to discard data from vendors whose prices were high. Mr. Fassett testified that, in a competitive bid situation, the contract is awarded to the low bid submission. Exh. 8 at 6, 8. Competitive bid contracts are typically awarded to the low bid submission in which the engineering tasks are well specified. Since the installation conditions in the AT&T questionnaire were not defined, we conclude that it was inappropriate to discard such data. The Hatfield team did not know if the high bids were due to prices that were not sustainable in a competitive marketplace, the hypothesis offered by AT&T witness Fassett, or because



the high prices reflected the contractor's perception of installation conditions which differed from the views of other contractors.

95. Even if the terms had been defined in the questionnaire, the collection of data should have been done in a manner consistent with the way in which the information was to be used in the Hatfield Model. That is, the definition of rocky soil provided to the contractors should have been consistent with the way in which the term is used in the Hatfield Model. We note that while the Hatfield Input Portfolio discusses the modeling of soft and hard rock, these terms do not appear in the questionnaire sent to some of the contractors. Exh. CC-54, Attachment A, Bates GHATF000262-GHATF00265; Exh. 40, Hatfield Model Release 3.1 Inputs Portfolio, Section 2.7, and Hatfield Model.

96. We find that the outside plant data collected from the vendors by the Hatfield engineering team do not provide sufficient validation for the opinion of these experts.

97. It is unfortunate that GTE did not propose alternative input values for the Hatfield Model. The FCC has stated that an incumbent local exchange carrier, such as GTE, is obligated to prove the nature and magnitude of the costs it seeks to recover:

We note that incumbent LECs have greater access to the cost information necessary to calculate the incremental cost of the unbundled elements of the network. Given this asymmetric access to cost data, we find that incumbent LECs must prove to the state commission the nature and magnitude of any forward-looking cost that it seeks to recover in the prices of interconnection and unbundled network elements.

FCC Interconnection Order at ¶1680.

98. In summary, the Commission disagrees with the method used by the Hatfield team to collect data from outside plant contractors. However, no reasonable alternative Hatfield Model input values were provided. Consequently, lacking an alternative, the Commission will utilize the model's default values. Our determination of the loop cost has taken into account the likelihood that the Hatfield Model understates cable placement costs.

## **B. Pole Costs**

99. The Hatfield Model assumes that a 40 foot, class 4, pole can be installed for \$417.00. This value reflects the material and labor costs, as well as periodic down-guys and anchors. Exh. 40, RAM-3, at 16.

100. GTE witness Murphy criticizes the Hatfield model input for poles. Here, too, Mr. Murphy stated that the default value used in the model does not comport with the data collected from the outside plant vendors. He also faults the Hatfield engineering team for selecting a labor price from a different vendor than the one that supplied the material price. Furthermore, he expresses a concern that the Hatfield Model's input excludes the cost of down-guys and poles. Exh. CC-54 at 16-22.

101. AT&T/MCI witness Fassett responds that the Hatfield Model's material price for poles is reasonable when compared and contrasted with data provided by GTE and U S WEST. Mr. Fassett also responded to Mr. Murphy's claim that the Hatfield Model does not account for the cost of guys and anchors, suggesting that these costs are included in the loaded labor rate. Exh. 8 at 11-14.

102. GTE identifies the cost of guys and anchors, but does not suggest the likelihood that this equipment is required on every pole. Exh. CC-54 at 19.<sup>15</sup>

103. We are concerned that the cost of guys and anchors may have been excluded from the Hatfield model. Furthermore, we find that it was inappropriate of the Hatfield engineering team to obtain the cost of labor from one bid and the cost of materials from another.

104. GTE suggests, without providing any citation in support of the value, that the appropriate input value is \$737.00. We are equally reluctant to use this undocumented value, insofar as it appears inconsistent with some of the evidence contained in the record.<sup>16</sup> For example, according to U S WEST, the average cost of the poles it installs is \$336.00. This value, which is based upon the average cost for poles ranging in size from 22 to 50 feet, includes both material and installation costs. Exh. 114, MSR-2, at 11. Consequently, lacking an alternative, the Commission will utilize the Hatfield Model's \$417.00 default value.

### **C. Rock Hardness; Road Cable; Horizontal Connecting Cables; Algorithm Errors**

105. As part of the calculation of the cost of installing cable facilities, the Hatfield Model incorporates an additional cost for installation based upon depth of bedrock, hardness of bedrock, and surface soil texture. Exh. 23 at 9. Sprint criticizes

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<sup>15</sup>In BCPM, for example, guys and anchors are assumed to be placed on every sixth pole. Folder Misc. Table Inputs.

<sup>16</sup> The \$737.00 value is consistent with the input value for the BCPM. Tr. 644. However, there is no documentation to support the reasonableness of the BCPM input. See discussion, *supra*, at paragraph 83.

the method used by the Hatfield Model to account for difficult terrain. Sprint notes that the value the Hatfield sponsors used to correct for difficult terrain resulted in a lower cost estimate than that suggested by some of the contractors contacted by the Hatfield engineering team. Sprint Brief at 49; Tr. 487-88.

106. Sprint points out that the State Members of the FCC's Joint Board on Universal Service concluded that the BCPM method used for difficult terrain was more reasonable than the Hatfield method. Exh. 23 at 9. Neither Sprint nor any other party explained how the BCPM difficult terrain cost estimation process could be incorporated in the Hatfield Model. Sprint Brief at 49.

107. Sprint also points out a number of other problems with the method used by the Hatfield Model to estimate placement costs. Sprint Brief at 49-50; Exh. 57 at 8-9. U S WEST also identifies some Hatfield Model errors which caused the cost of the loop to be understated. Exh. 47, MAC-3, at 9.

108. In a response to Commission Bench Request 04-001, GTE and U S WEST point out that some of the algorithmic errors contained in the first version of the Hatfield Model version 3.1 have been corrected. GTE and U S WEST note that at least two errors existed in the revised version of Hatfield 3.1. These errors cause the model to omit certain sub-feeder cables and maintenance expenses. AT&T/MCI concurs that at least the former of the programming errors has not been corrected. AT&T/MCI Submission December 17, 1997; GTE and U S WEST Response to Bench Request, March 12, 1998.

109. U S WEST identifies how these two errors could be corrected. We have implemented the proposed changes in the version of the Model that we use to estimate the cost of the loop. U S WEST Response to Bench Request, March 12, 1998.

110. GTE's March 12, 1998 Bench Request Response identifies an additional algorithmic error related to horizontal connecting cable. We have not implemented the proposed modification because we find the presentation unconvincing, and the claimed cost impact, an approximately 30% increase in loop costs, implausible.

#### **D. Drops**

111. A primary difference between the drop cost estimates of GTE and the Hatfield Model is attributable to the different assumptions regarding when a drop is installed. The Hatfield Model assumes that drop wire is installed by "a crew installing aerial drop wires throughout a neighborhood or CBG in coordination with the installation of NIDs, terminals, and distribution cables." Exh. 40, RAM-3 at 10.

112. GTE argues that it is more appropriate to measure the cost of installing an individual drop. GTE states that this is the more appropriate activity to study since GTE is “require[d] to install drops wherever requested to do so by a CLEC.” GTE Brief at 61.

113. GTE adds that the Hatfield Model “impermissibly requires GTE to absorb the cost difference between a complete reinstallation of drops, terminals, and cable throughout a CBG and the cost of installing equipment on a more limited basis.”

114. We find GTE’s methodology to be inconsistent with the objective of measuring total element long-run incremental cost. The study methodology assumes that a new network is being constructed, subject to the constraint that the current location of wire centers does not change. Whereas the cost of satisfying the total demand for service is being modeled, it is inappropriate to measure the cost of installing only one drop wire.

115. For the drop wire, GTE has effectively submitted a marginal, not a TELRIC, cost study. GTE has estimated the cost of installing one additional drop wire. GTE has implicitly presumed that each time a loop is ordered, a craftsperson must install a new drop. Simultaneously, it assumes that all existing customers have a drop. Exh. 92. These two assumptions are inconsistent. If every time a loop is ordered, a new drop must be installed, then it is appropriate to suppose, as does the Hatfield Model, that line crews would be deployed to install drops to all houses simultaneously. Individual loops would be installed if some customers already had connections to the network. But if the latter conjecture is made, it is inappropriate to assume, as does GTE, that all UNE loop orders would require a new drop. Instead, some of the UNE loops would be able to use the drop facilities that are already in place.

116. Due to this inconsistency in the study, we have reduced by \$28.00 GTE’s estimate of its drop investment. This is equivalent to a \$0.69 reduction in the monthly cost of the loop.

117. There are two inputs that account for most of the cost of the drop wire: the length of the facility and the per-foot placement costs.

118. For most density zones, the Hatfield Model assumes that 70%-75% of drops will be buried, and that 25%-30% will be aerial. Exh. 40, RAM 3, at 11. Hatfield assumptions for the length of the facility range from 50 to 150 feet. Hatfield presupposes a buried drop placement cost of \$0.75 per foot for the six lowest density zones. For the remaining three density zones, the Model assumes a per-foot cost which ranges from \$1.13 to \$5.00. Exh. 40, RAM-3, at 9. Aerial drop costs range from a total installed cost of \$11.67 in urban areas to \$53.33 in rural areas. *Id.* at 10.

119. In order to validate the reasonableness of these inputs, the Hatfield

engineering team collected data from various construction companies. One of the respondents provided data specific to Washington State, while others provided cost information that was applicable to multiple states, including Washington. The Washington specific data suggests that the placement costs for buried drops are in the range of \$2.00 to \$5.00 per foot. The Hatfield team did not use this value because they did not deem it to be reasonable. Tr. 316-321.

120. BCPM uses a drop cost per foot for material and installation of \$0.77. Exh. 83, Attachment 1, at 38. The BCPM value of \$0.77 per foot is equivalent to using a cost per foot for buried cable of \$0.897 in the Hatfield Model. These two values are equivalent, because the BCPM value is used for aerial and buried drops. The Hatfield Model cost of placing aerial cable is approximately \$0.39 per foot.

121. The Hatfield Model includes a material cost of \$0.14 per foot. Exh. 40, RAM-3, at 13. The \$0.75 Hatfield installation cost, plus the \$0.14 material cost for the drop wire, raises the total cost per buried drop foot in the Hatfield Model to \$0.89. Therefore, the Hatfield and Benchmark Cost Proxy Model use similar input values for the cost of labor and material associated with installing buried drops.

122. Neither GTE nor U S WEST challenged the BCPM drop input value of \$0.77 per foot.

123. Based upon the information in the record, we have not changed the cost-per-foot input value in the Hatfield Model.

124. GTE contends that the drop lengths are understated in the Hatfield Model. GTE states that the input values to the Hatfield Model are understated, relative to the data collected by the Hatfield engineering team. Furthermore, the Company points out that in its own study, it "assumes the length of the drop to be 100 feet for high density, 150 feet for medium density, and 250 feet for low density areas."<sup>17</sup> GTE Brief at 62.

125. GTE does not contend that its own inputs are based upon a study of actual drop lengths in Washington State. *Id.* Instead, they have a different set of assumptions: GTE uses the same lengths in its various service territories throughout the nation. Tr. 1108-1109.

126. The BCPM documentation does not explicitly state the drop lengths used in the model. Exh. 83, Attachment 1. Rather, the drop cost is determined endogenously, based upon the length to the center of a lot. The drop is terminated on

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<sup>17</sup> The installation times used in the GTE drop study are a function of these loop lengths. Exh. 65, WATELRIC.WK4, folder Drop\_Inv, line 42. The installation times do not appear to be reasonable, especially for rural installations. We have not made any adjustment to these values in this proceeding; it should not be inferred that we believe these inputs are necessarily correct.

a network interface device. AT&T/MCI assert that it is unreasonable to assume that the NID is in the center of the lot, as "most houses tend to be toward the front of the lot with a larger back yard than front yard; thus, BCPM overstates the drop length that, on average, would be necessary." Exh. 6 at 29. Sprint counters that generally in urban and suburban areas, houses are serviced not from the front, but from the back lot line. Sprint Brief at 50.

127. AT&T/MCI did not identify the cost impact of the BCPM assumption. AT&T/MCI Brief at 50.

128. WITA asserts that the proxy models underestimate drop lengths in rural areas. WITA Brief at 20. WITA does not identify the magnitude or the source of the error.

129. U S WEST points out that, in 1995 and 1996, their actual drop investments in Washington State averaged \$209.00 per line. This value exceeds the \$80.00 maximum drop cost estimated by the Hatfield Model. U S WEST adds that "RLCAP's assumption of approximately \$150.00 for drop investment, while very conservative, is a far more realistic investment." U S WEST Brief at 47-48.

130. The loop lengths used in the Hatfield Model are, in general, shorter than the values used in RLCAP. Exh. C-115, RLCAP, folder drop, cells G26, G38, and N30.

131. U S WEST argues that the average investment for a new drop in 1995 and 1996 was \$209.00. U S WEST proposes that in order for similar investment values to be produced by the Hatfield Model, all drop lengths be increased by 50 feet. U S WEST also proposes a few other changes to the method used to calculate the drop investment. Exh. 47, MAC-2, Table 3 and Document 3.2. While we find this information of some use, U S WEST did not show that the costs are associated with a TELRIC environment. We are concerned that the U S WEST costs are associated with satisfying incremental, rather than total demand.

132. Commission Staff concludes that the drop costs in the Hatfield Model "appear reasonable." Exh. 104 at 21-22. Staff did not perform any studies to determine the average loop length of GTE's drop lengths. Instead, the reasonableness of the values was based upon the Staff witness' familiarity with conditions in Washington State. Tr. 1670.

133. Unfortunately, no party has provided the results from a study in which they have identified the actual drop lengths. Rather, each party has relied upon a different set of assumptions. In future proceedings, we strongly encourage the parties to substitute the results from a study for their value judgements.

134. For each of the density zones with less than 2,550 lines per square mile, we increase the Hatfield drop lengths by 25 feet. We make this adjustment based upon the data found in the GTE and U S WEST studies, as well as the information collected

by the Hatfield engineering team on Washington State loop lengths. We do not adjust the lengths in the other studies because no alternative lengths are proposed. The lack of adjustment to these studies should not be interpreted as an acceptance of the values.

135. We find the Hatfield Model's methodology for estimating the time associated with installing a loop to be more reasonable than the approach adopted by GTE.<sup>18</sup>

136. The drop wire is part of the loop. The cost estimation of the drop wire should use the same set of assumptions as are made in estimating distribution and feeder costs. For those facilities, the models assume that capacity is being installed to meet total demand. Methodological consistency requires that the same level of demand be used when estimating the cost of the drop. The cost of the drop is a function of the length of the loop. We will require that in future proceedings, parties present evidence on the actual lengths of loops in Washington State, rather than relying on regional or national data.

## **E. Load Coils**

### **1. Recurring Costs**

137. The length of the loop that connects a customer premises to an ILEC central office affects the type of service that can be provided to the customer. On long loops, load coils have historically been added to copper wires in order to improve the quality of voice communications. Tr. 360. Advanced digital services cannot be provided over loops that contain load coils.

138. The FCC has adopted a requirement that rural customers should have access to the same quality of service as subscribers in urban areas. *In the Matter of Federal-State Joint Board on Universal Service*, CC Docket 96-45, Report and Order, (May 8, 1997), ¶21 (FCC Universal Service Order).

139. Sprint contends that the BCPM complies with this requirement, because it is engineered to allow for the provision of advanced service capability on all loops, urban and rural. Sprint Brief at 55.

140. The Hatfield Model assumes that customers who are more than 18,000 feet from a digital line carrier will be served with load coils. Such customers are generally found in rural areas. A network built following this assumption would not have the capability of complying with the FCC's requirement for urban/rural service parity.

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<sup>18</sup> Furthermore, we conclude that the GTE asserted driving time associated with an installation is unreasonable. Exh. C-69, Bates 000104.

141. The FCC has rejected the use of long loops with load coils to serve rural customers, because “they impede the provision of advanced services.” Universal Service Order at ¶250.

142. Load coils have been excluded from the GTE loop model and the BCPM. Tr. 360-364; GTE Brief at 67; Sprint Brief at 55-56.

143. Load coils are not compatible with digital services, therefore, U S WEST contends that the cost of removing the load coils should be reflected in a cost study. U S WEST Brief at 52. AT&T/MCI responds that load coils are typically removed for the provision of broadband services, which reflects the ILEC’s failure to maintain a modern network. Consequently, this cost should not be reflected in the cost of providing an unbundled, voice grade loop. Tr. 363; AT&T/MCI Brief at 53-54.

144. We find AT&T/MCI’s position on load coils to be inconsistent. The Hatfield Model has been characterized as a tool which estimates the cost of service using forward-looking technology. Since load coils are part of the sponsor’s vision of a forward-looking network, the cost of removing the load coils are not, as suggested by AT&T/MCI, the result of “an ILEC’s failure to properly update its network.” AT&T/MCI Brief at 54.

145. We concur with the FCC that on a forward-looking basis, load coils will not be installed by local exchange companies. Universal Service Order at ¶250. We also agree with Sprint that removing the load coil algorithms from the Hatfield Model “would require fundamental reengineering of the model.” Sprint Brief at 56.<sup>19</sup> Whereas we are unable to remove the load coils, we will take into account in our calculation of loop costs that their inclusion in the Hatfield Model results in an understatement of forward-looking loop costs.

## **2. Nonrecurring Costs**

146. With regard to removing load coils currently installed in the network, AT&T/MCI argue that this cost would rarely be incurred. They further contend that U S WEST’s nonrecurring cost study for deloading is flawed, because it presumes that the cost would be recovered from one customer when there are often up to twenty-five lines deloaded simultaneously. AT&T/MCI Brief at 54.

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<sup>19</sup> AT&T/MCI note that future versions of the Hatfield Model will exclude load coils. AT&T Brief at 53.



147. We find that where deloading occurs, the costs should be assigned to those lines for which removal of the load coils has been requested. AT&T/MCI argue that deloading is undertaken to meet the more stringent technical requirements of broadband customers. The customers who have requested the activity, rather than ordinary voice customers, should pay for the cost of removing the load coils.

148. U S WEST's cost study assumes that when load coils are removed from installed facilities, one loop will pay the cost of removing the load coils from 25 pairs. AT&T Brief at 53. AT&T does not challenge the cost associated with the unloading, but states that it is improper to recover the cost from one loop. In Phase II of this proceeding, we will require the parties to submit a rate proposal where the cost is recovered from all cable pairs in the 25-pair binder group that have requested the activity. For example, if the cost of unloading is \$100.00 for the 25 pairs, and four pairs require the unloading, the cost might be recovered from all four pairs in such a manner that the total charges equal \$100.00.

149. In its recurring cost loop study, U S WEST identifies the engineering and labor costs of installing load coils on a 600 pair underground and 300 pair buried cable. The per-pair labor cost associated with these larger installations is approximately one-fourth the reported cost for removal of load coils and bridge taps in the Company's UNE NRC study. RLCAP folder PRICER, cells Q245, R245, Q189, and R189, versus LIS-LINK Unloading, December 1996, at 31 of 32. We recognize that there are some economies of scale associated with installing or removing load coils, but the magnitude of the difference suggested by the Company's studies is unreasonable.

150. U S WEST assumes there is 160 minutes of work time at each of the three splice locations. We find this time estimate to be unreasonable. Especially troublesome are the times for site set-up and site tear-down. While the proposed values may be appropriate for underground cable, they are clearly too high for buried and aerial installations. We find that 120 minutes for each of the three splice locations visited, or a total of 360 minutes, is a more reasonable assumption.

151. U S WEST assumes that when deloading occurs, three hours of outside plant engineering is required. We find this assumption to be unreasonable. The engineer must identify the location of the load coils but this process should not require three hours of work. Therefore, we will require U S WEST to refile this study using an input time of sixty minutes.

152. The cost study also includes a mark-up for common costs. Whereas we have concluded that the recovery of common costs is a Phase II issue, we will require that this cost be removed from the study.

153. The U S WEST study assumes that the removal of bridge taps would

occur at three locations. We find this assumption to be unreasonable. With single-party service, the bridge tap removal would occur at only one location. We therefore will require U S WEST to file a revised cost study for the removal of bridge taps that reflects the assumption of one site set-up, tear-down, and splice operation. The study should also reflect the aforementioned adjustments for splice technician work time and outside plant engineering.

154. Whereas the electronic version of the U S WEST cost study does not contain linked cells, we will require U S WEST to modify its load coil unloading and bridge tap cost studies consistent with our findings as fully described in this section of the Order. The revised studies must be filed no later than 21 days after the date of this Order.

155. Load coils are not a forward-looking technology and therefore they should be excluded from a loop model that is estimating forward-looking recurring costs. On the other hand, in the near-term, there will be occasions where a CLEC will request that load coils or a bridge tap be removed from existing facilities. Load coils or a bridge tap are removed to satisfy the requirements of a particular end-user. We believe that it is appropriate to recover these customer specific costs from the cost-causer.

#### **F. Integrated/Universal Digital Carrier**

156. Prospectively, digital line carrier is used on long loops between the carrier serving area interface and the central office. With no unbundling, these loops enter the switch on an integrated (still concentrated) basis and are separated into individual loop information in the switch. According to U S WEST and Sprint, when a CLEC leases loops without leasing switching, it is necessary to split individual lines from concentrated lines prior to entering the switch. Otherwise, the unbundled loops will use switching capacity and, therefore, cause additional switching costs. Sprint Brief at 56-57; U S WEST Brief at 52-53.

157. The parties disagree about the cost of splitting out the unbundled loops prior to entering the switch. AT&T/MCI contends that on an efficiently designed network, little additional equipment is required for grooming. Therefore, they argue that this cost should be excluded from the cost of the unbundled loop. AT&T Brief at 55.

158. Sprint and GTE claim that additional costs are incurred with grooming. Sprint Brief at 57; Exh. 53 at 32.

159. During the hearings, U S WEST stated that it had reconsidered the assumptions in its link study to reflect the impact of new technologies. U S WEST Brief at 53. Using the prescribed depreciation lives, U S WEST estimated that the cost of using grooming was \$2.85 per line. Tr. 1910.

160. U S WEST has stated that it is economic to use digital line carrier on fiber only, rather than on copper cables, when the feeder distance is greater than 12,000 feet. Whereas a sizeable portion of the loops will not be served using digital line carrier, its monthly cost of \$2.85 for grooming appears to be on the high side.<sup>20</sup> We note that in New Mexico, U S WEST testified that the cost of grooming was approximately \$1.81. *In The Matter of The Interconnection Contract Between AT&T Communications of The Mountain States, Inc., And U S WEST Communications, Inc., Pursuant to 47 U.S.C. Section 252*, New Mexico State Corporation Commission, Docket No. 96-411-TC (March 27, 1997), ¶¶124 and 125.

161. If a CLEC were to order a bundled loop and port from an ILEC, the cost of grooming would be avoided. Exh. 162, URI-2, at 7.

162. Neither the ILECs nor the CLECs present technical documents which support their claims about the current capabilities of digital line carrier systems or the costs associated with that equipment. The record evidence suggests that technological change is reducing the cost of grooming, but we remain unconvinced that the Hatfield Model fully accounts for this cost.

163. On this issue, the FCC has ruled that the costs associated with grooming should be recovered from the requesting carrier: "We find that it is technically feasible to unbundle IDLC-delivered loops . . . [t]he costs associated with these mechanisms will be recovered from requesting carriers." FCC Interconnection Order at ¶384.

164. We concur with the findings of the FCC. Therefore, based upon the evidence of record, we will include an unbundling cost of \$2.85 in the U S WEST link study. We will not add any costs for grooming to the Hatfield Study. Since we will use both models to determine the cost of the loop, both positions will be reflected in our final cost determination.

## **G. Fill Rates**

165. The fill rate is the actual usage of the network relative to its total capacity. Fill is used to calculate per unit costs.

166. The FCC has stated that the calculation of the total element long-run

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<sup>20</sup> We are unable to locate the work papers associated with the \$2.85 value. Exh. 162, URI-4.

incremental unit costs should be based upon reasonably accurate fill factors. According to the FCC, “the per-unit costs associated with a particular element must be derived by dividing the total cost associated with the element by a reasonable projection of the actual total usage of the element.” FCC Interconnection Order at ¶682.

167. U S WEST contends that its current fill rate is the best predictor of its projected fill rates. U S WEST’s loop model uses a feeder fill rate of 58%. This is the lowest utilization level observed in the several states served by U S WEST. According to the Company, 67.6% is the highest actual fill factor in any state it serves. Exh. 114 at 16.

168. Previously, we have found that the objective fill rate should be used in U S WEST cost studies. The objective fill is the level of utilization at the point at which additional equipment is installed to meet the level of demand. The objective fill is almost always greater than the actual fill. U S WEST states that it is uneconomical to operate facilities at objective fill, because each new service order would require expensive additional equipment. Exh. 114 at 15-16.

169. Commission Staff and Public Counsel urge the use of objective fill rates. Staff points out that, in prior decisions, most notably the 1995 U S WEST rate case, we found that objective fill should be used in cost studies. Commission Staff Brief at 30; Public Counsel Brief at 88. In that decision, we stated: “Using objective fill will assign a reasonable portion of unused capacity to individual services. The remaining unused capacity is most appropriately treated as a shared cost. This issue ultimately has no effect on whether U S WEST recovers the cost of this unused capacity, since shared costs also are recovered in rates.” Fifteenth Supplemental Order, Docket No. UT-950200 (April 11, 1996), at 88.

170. U S WEST contends that, if objective fill is used in a cost study and if prices are to be strictly based upon costs, then use of objective fill in a cost study will result in an inability to recover costs. The Company believes that the Hatfield Model’s default values are “fairly reasonable.” U S WEST Brief at 49.

171. It is not appropriate to use the objective fill rate in TELRIC studies. As the FCC stated when they introduced the notion of basing unbundled network element prices on TELRIC, “the per-unit costs associated with a particular element must be derived by dividing the total cost associated with the element by a reasonable projection of the actual total usage of the element.” FCC Interconnection Order at ¶682. Whereas the objective fill is greater than the actual and projected fill rate, the use of an objective fill is contrary to the concept of deriving TELRIC.

172. More fundamentally, there is an important difference between the use of a cost study for the setting of rates in a rate case and in a TELRIC proceeding. As we stated in Docket No. UT-950200, U S WEST will be able to recover its total costs regardless whether objective or projected fill rates are used in the cost study. The cost studies that were at issue in the 1995 rate case were being used to help establish rates that would permit U S WEST the opportunity to recover its cost-of-service. In this proceeding, we are not considering all of the rates of the Company. If the shared cost of unused capacity is not part of the element cost estimate, recovery of the shared cost must be considered during Phase II of this proceeding. We believe that it is more expeditious to assign each element the same share of unused capacity, rather than leaving this as an open matter to be addressed in Phase II.

173. We have not used the objective fill rate in any of the cost models. For the Hatfield and Benchmark Cost Proxy Models, we have used their default utilization rates.

174. For the distribution portion of its network, in its RLCAP model, U S WEST uses “[t]he actual number of lines in service” to calculate unit costs. Exh. 114 at 16. For suburban households, this involves assuming that the distribution plant is engineered with three lines per household. Even though the current level of demand is less than three pairs, U S WEST contends this is the correct level of provisioning, because of the growth in demand for multiple lines in a household, as well as to ensure reliable service in case of the failure of cable pairs. Exh. 114 at 18.

175. Paradoxically, on the demand side, U S WEST assumes that the number of working lines per household would decline relative to the current value. While saying that there is a growing demand for second, third, and fourth lines, the Company’s model assumes that each household would have only one telephone per line. Exh. 152 at 26-27. This value is less than the current ratio of lines per household. According to the testimony of U S WEST witness Reynolds, in Washington State on average 3%-4% of the residential customers have an additional line. Exh. 117 at 29.<sup>21</sup> In response to a data request, U S WEST indicated that in 1998, the percentage of residential households with second lines would be significantly higher. Public Counsel Brief at 13; Response to PC 02-0028, provided in response to BCH 01-0002. The U S WEST assumptions also result in a much lower fill than that which is recommended by the Hatfield Model defaults, values that U S WEST finds to be reasonable. See, for example, U S WEST Brief at 49; Exh. 114, Appendix 6, at 22 (BCM2); BCPM inputs, folder Percent Table Inputs, Table Density Fill Table (U S WEST has sponsored the development of both BCM2 and BCPM).

176. The U S WEST loop model, RLCAP, has an effective distribution

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<sup>21</sup> BCPM input folder Misc. Table Inputs, row 70, reports that the ratio of residence loops to households is 1.0967.

utilization level of approximately 33%. AT&T/MCI witness Zepp modified the U S WEST loop model to reflect a 50% fill factor, a rate not unlike that used in the HM and BCPM proxy models. He did this by increasing the level of demand to 1.5 lines per household. This adjustment reduced the loop cost by 27%. Exh. 117 at 29-30.<sup>22</sup>

177. U S WEST claims that the adjustment made by Mr. Zepp is inappropriate, arguing that if an analyst wanted to explore the impact of a higher utilization rate, the number of pairs per household should be held constant, effectively at one, and instead a smaller size distribution cable should be modeled. This reduction in the number of pairs per household from three to two reduces the cost per loop by less than 5%. Exh. 117 at 27-31.

178. Mr. Zepp's method for obtaining a 50%fill factor has a larger impact on the cost per loop than U S WEST's recommended method. The different impact, 27% versus 5%, is due to the way in which unit costs are derived. The unit cost of production is the total cost divided by total demand. The installation of a loop is a labor intensive process. Under the U S WEST methodology, the reduction in the number of pairs per household results in a small change in the material cost, but not a large change in the total cost of installing loops. Neither is there any change in the level of demand. On the other hand, with Mr. Zepp's method, there is no change in the total cost, that is the numerator, but there is a large increase in the denominator, the level of demand.

179. We find AT&T/MCI's study approach more reasonable. U S WEST has argued that there is an increased demand for second, third, and even fourth lines. Exh. 117 at 39. In order to meet this growth in demand, the Company is now deploying three lines per household. The study approach taken by U S WEST conflicts with their testimony on the forward-looking design of the network. Whereas demand for multiple lines is increasing, AT&T/MCI's costing approach is the appropriate method for analyzing the demand for multiple lines.

180. Accordingly, we adjust U S WEST's RLCAP model to increase the percentage of additional lines. We do not adopt AT&T/MCI's use of 1.5 lines per household, because this value is well above the current level of demand. Instead, we adopt a value of 1.25 lines per household. This level of use is in line with the proprietary forecast provided by U S WEST. Exh. 127.

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<sup>22</sup> Public Counsel urges the Commission to use the 1.5 lines per household if it does not use objective fill rates in the cost studies. Public Counsel Brief at 16.

181. We also adjust the RLCAP feeder utilization to 65%. This value does not reflect best-system practices, but it is higher than the level currently experienced by U S WEST in Washington State. Furthermore, the value is reasonable in light of the historical practice of installing 1.5 feeder pairs per household and is consistent with the default values used in the Hatfield Model. Tr. at 1905.

182. Public Counsel criticizes the GTE loop model for its treatment of spare capacity. Public Counsel Brief at 14-15. The GTE loop model applies a 55% fill factor to both feeder and distribution plant. Exh. 31 at 16. The 55% fill factor is based upon the Company's study of the current level of utilization in 14 states in which it operates. The GTE study apparently does not reflect the growth in demand that it anticipates over the next few years. Tr. 2285; Exh. 65; GTE Brief at 64.

183. GTE witness Tucek testified that the California Public Utilities Commission (CPUC) has recently ordered a change in the fill factors utilized for feeder and distribution in GTE's cost studies. The CPUC ordered the use of a 65% fill factor. Exh. 65 at 25. We adopt the use of a 60% fill factor for the running of the GTE model in this proceeding.<sup>23</sup> We have selected a lower value because, while 65% is reasonable for the feeder portion of the network, we believe the composite loop fill factor should be lower to reflect utilization in the distribution portion of the network.

184. GTE has not provided an integrated loop model. The loop model was written in 'C' and is difficult for a party to modify the program. Exh. 31 at 14. GTE did provide a LOTUS-version of its cost models, WATELRIC (Exh. 65), but the spreadsheet only summarizes the calculations done in other programs. The spreadsheet only provides limited opportunities for evaluating the cost impact of different input assumptions. For example, while the spreadsheet has a location for changing the assumed loop fill of 55%, a change in this input has no impact on the calculated costs. GTE also provided a spreadsheet, LTM\_WA.WK4, that replicates the logic and modeling assumptions contained in its Loop Technology Model. This spreadsheet only replicates a portion of the model and therefore provides only limited opportunities to conduct sensitivity analyses. Furthermore, the spreadsheet does not appear to provide any insight into how GTE calculated the cost of a four versus a two wire loop. Exh. CC-64.

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<sup>23</sup> Due to the closed nature of the GTE model, it is not possible to determine if the resultant sizing of cables makes economic sense. In future proceedings before this Commission, GTE must employ a cost model that is both transparent and open. A transparent model offers the opportunity to observe how calculations are being made, even if the analyst would not change the algorithms. By open, we mean the model would be readily and easily susceptible to modification of the program algorithms.

185. The LTM\_WA.WK4 spreadsheet only replicates a portion of the GTE loop model. We will use the worksheet for the limited purpose of testing the impact of increasing the utilization level to 60%. The spreadsheet suggests that the level of investment would decline 8.7%. We accept that the level of costs would decline proportionately.

186. Public Counsel also claims that GTE's method for calculating the cost impact of spare capacity is in error. Public Counsel notes that the method is flawed because the adjustment for spares is applied to the incorrect size of cable. Public Counsel Brief at 15.

187. We concur with Public Counsel. GTE's loop study is flawed because, as recently stated by the New Mexico State Corporation Commission, it "develops a unit cost based on a size cable that is inconsistent with the assumed level of utilization." *In the Matter of the Interconnection Contract Between AT&T Communications of the Mountain States, Inc. and GTE Southwest, Inc. Pursuant to 47 U.S.C. §252*, Docket No. 97-35-TC (September 19, 1997), ¶154.

188. Unfortunately, because the GTE loop model is a compiled 'C' program, we are unable to correct this error. Our loop cost has taken into account that this flaw results in an overstatement of the cost of the loop.

#### **H. Four-Wire Loop**

189. The parties also disagree about the additional cost associated with providing a four wire loop. An ordinary loop requires the use of only two wires, or one pair of cables.

190. U S WEST has assumed that the investment for a two-pair cable is twice that for a four-pair cable. Exh. C-115, Local Interconnection Service - Link - 4-Wire, 1996 Recurring Cost Study, November 1996, Section 7, at 1b.

191. This assumption is inconsistent with U S WEST's argument that the incremental cost of providing an additional pair of wires to a subscriber is approximately five percent of the cost of a loop. Exh. 117 at 27-31. The incremental cost of a second pair of cables is low because a significant portion of the cost of the loop is associated with labor costs that are independent of the size of the cable.

192. Neither the Hatfield nor the Benchmark Cost Proxy Models report the difference in the cost of providing a two-wire versus a four-wire loop.

193. GTE's study indicates that the cost of a four-wire loop is approximately 50% higher than a two-wire loop. Exh. CC-64 at 55.



194. For the reasons discussed, *supra*, at paragraph 184, it is not possible to determine how GTE calculated these values.

195. Based upon the evidence of record, we find that the cost of a four-wire loop is 25% greater than a two-wire loop. This value falls between the five percent value suggested by U S WEST and the 50% difference reported by GTE.

### **I. Cable Size/Lengths and Fiber/Copper Breakpoints**

196. One of the inputs to the loop models is the distance at which fiber or copper cable is used in the network. The Hatfield Model assumes that on a forward-looking basis, the crossover point should be at 9,000 feet from the central office. U S WEST, GTE, and Commission Staff contend that the appropriate crossover point is approximately 12,000 feet from the central office. U S WEST Brief at 50; GTE Brief at 66; Commission Staff Brief at 31; AT&T/MCI Brief at 53.

197. In the Hatfield Model, the selection between these two technologies is based upon the total length of feeder cable from the wire center to the serving-area interface. The BCPM default set the maximum loop lengths for copper at 12,000 feet for both feeder and distribution cable.

198. We accept 12,000 feet as the crossover point as proposed by U S WEST, GTE, and Commission Staff. Implementing this determination within the BCPM is difficult, since the crossover point is calculated based upon the total distance to the customer, rather than the distance to the serving-area interface. Therefore, we have changed the input value in the BCPM so that the maximum loop length for copper is 15,000 feet.

### **J. Special Access (Above DS-0) Loops**

199. The Hatfield Model includes special access DS-1 and DS-3 lines by assuming them to be the equivalent number of DS-0 lines in terms of capacity. In other words, the Hatfield Model treats a special access DS-1 line as 24 separate voice-grade loops; similarly, it treats a special access DS-3 line as 672 voice-grade loops.

200. U S WEST maintains that the Hatfield treatment of special access DS-1 and DS-3 lines is improper, because these non-switched digital lines are not the functional equivalent of, and not the same TELRIC element as, a narrow band unbundled loop. Moreover, U S WEST observes that the economies of scale that Hatfield assumes in access line placement causes the cost of unbundled loops to unjustifiably decrease. Exh. 46 at 9. According to U S WEST witness Fitzsimmons, there are 202,488 DS-1 and DS-3 channel equivalents in Washington State. *Id.* Including those increases the line count in the state by seven percent. He proposes including the DS-1 and DS-3 lines only on a physical line, not a channel equivalent

basis. Doing so would increase the per-line monthly cost by \$0.66 per month. *Id.* at 11; U S WEST Brief at 51; TRACER Brief at 26.

201. TRACER argues that, if the adjustment is made to the line counts, there would need to be an offsetting adjustment to the investment in drops and NIDs. TRACER Brief at 27-28, quoting from Tr. 628-30. TRACER suggests that if the second adjustment is made, there may be a corresponding offset. TRACER Brief at 28.

202. Neither TRACER nor AT&T/MCI provided any data that suggests that the adjustment for drops and NIDs would offset the adjustment for line counts. We do not find TRACER's suggestion compelling because the drop and NID constitute a minority of the investment in the loop.

203. GTE also disagrees with the Hatfield Model's treatment of special access DS-1 and DS-3 lines. GTE did not identify the cost impact of treating these special access lines simply as a physical line. GTE Brief at 66-67.

204. We have adjusted the Hatfield Model loop cost for U S WEST upward by \$0.66. Whereas GTE did not propose any adjustment for this item, we will not make a similar change to its loop cost estimate. Nevertheless, we recognize the potential that such data may impact the loop cost.

205. The unit cost of a facility is determined by dividing the total cost by the level of demand. The Hatfield Model treats each voice channel equivalent as a unit of demand. This assumption is incorrect and leads to an understatement in the unit cost of providing a loop. As the telecommunications industry increasingly relies on digitally derived circuits, it is essential that a model developer distinguish between the number of physically derived circuits and the number of equivalent voice channels that are in-service.

#### **K. Capital Factors; Cost of Capital; and Depreciation**

206. The investments identified by the different models are converted to a monthly cash-flow requirement through the application of annual charge factors. Depreciation and the cost of capital are two components of the annual charge factors.

207. The ILECs argue that the Commission should establish cost-of-capital factors which reflect the risk associated with an increasingly competitive market. Exh. 113 at 27.

208. GTE uses a weighted cost-of-capital input of 11.25% for "illustrative purposes." GTE Brief at 36. U S WEST uses a cost of capital of 11.4%. U S WEST

Brief at 55. Sprint advocates the adoption of the rate authorized by the FCC -- 11.25%. Sprint Brief at 59.

209. Commission Staff, TRACER, TCG/Nextlink, AT&T/MCI, and Public Counsel believe that the most recent Commission authorized return and capital structure should be used in the cost models. Commission Staff Brief at 25, 32-33; TRACER Brief at 28; TCG/Nextlink Brief at 23; AT&T/MCI Brief at 56; Public Counsel Brief at 17.

210. In the Interconnection cases, we maintained our policy that the cost of money used in a cost study should be the same as the authorized return. We also noted that, as with other inputs into a model, this input should be reviewed periodically. We singled out the cost of debt as being the component that should be reviewed in a forward-looking cost study: "The Commission recognizes that the authorized return is based upon embedded costs, particularly with respect to debt rates." Fourth Supplemental Order, Docket No. UT-941464 (October 31, 1995) at 90.

211. In the 1995 U S WEST rate case, we determined that the authorized rate-of-return should be used in forward-looking cost studies: "[A]ny theoretical advantage of using 'pure' forward-looking values would be more than offset by the practical problems of turning every cost-based rate filing into a cost of money case." We reaffirm that determination in the instant Order. Fifteenth Supplemental Order, Docket No. UT-950200 (April 11, 1996) at 88.

212. Under the pricing standards set forth in Section 252(d)(1) of the Act, the rates charged for interconnection and unbundled network elements must be "based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing interconnection or network elements . . . nondiscriminatory . . . and may include a reasonable profit." The FCC recognized that the appropriate depreciation rate to be included in a TELRIC analysis is a forward-looking, economic depreciation rate. Economic depreciation is defined by the FCC as the "periodic reduction in the book value of an asset that makes the book value equal to its economic or market value." FCC Interconnection Order at ¶703, footnote 1711.

213. The ILECs contend that, due to increased rivalry in the local exchange market, the length of time within which they can recover their investment is reduced relative to the pre-Act era. U S WEST, GTE, and Sprint advocate the adoption of depreciation lives that are shorter than that which would occur under the triennial represcription process. Exh. 79 at 4; U S WEST Brief at 54; Sprint Brief at 60-61.

214. Commission Staff advocates using the most recently approved depreciation lives and salvage established by the Commission. Exh. 104 at 13. AT&T/MCI and Public Counsel also endorse basing the TELRIC costs on the existing approved depreciation rates. AT&T/MCI Brief at 56.

215. In the 1995 U S WEST rate case, we “concluded that the authorized depreciation rates are proper for cost study use and that they sufficiently reflect U S WEST’s costs that they may be used in an accurate cost study and for rate making purposes.” Fifteenth Supplemental Order, Docket No. UT-950200 (April 11, 1996) at 88.

216. U S WEST asks that if we are to rely on regulatory depreciation lives, the prescribed rates approved by the Commission on August 18, 1997, in Docket No. UT-951425, be used in this proceeding. U S WEST Brief at 54.

217. In depreciation proceedings in Docket Nos. UT-940926 (GTE) and UT-951425 (U S WEST), we considered the degree to which depreciation rates should be modified to reflect regulatory and market changes. For both GTE and U S WEST, we have used the average service lives and future net salvage values that were reported in those recent proceedings. The rates adopted in those proceedings reflect our understanding of the capital lives of the assets. We therefore conclude that the service lives are appropriate for a forward-looking economic cost model and adopt them for estimating the cost of unbundled network elements.

#### **L. Customer Locations**

218. The proxy models use census block group data to identify the location of households within the serving wire center. Business location information is obtained from a variety of commercial data sources.

219. Concern was expressed during the hearings that the models do not accurately identify customer locations. Some parties also expressed concern that the models attach customers to the incorrect wire center. GTE Brief at 47-48; WITA Brief at 10-11.

220. In response to a Commission bench request, the model sponsors provided a comparison of the loop length estimates generated by the proxy models with the distances identified in special studies undertaken by U S WEST and GTE. The special studies identified the loop lengths for each wire center, as well as the number of lines.

221. The comparison showed that the difference between the models and special loop length estimates was large. For example, for GTE’s wire centers, the ratio of Hatfield Model loop lengths to GTE special study loop lengths ranged from a low of 16% to a high of 884%. AT&T’s December 17, 1997 Response (AT&T’s Response),

Attachment 4; Sprint's November 21, 1997 Response (Sprint's Response).

222. For both the Hatfield Model and the Benchmark Cost Proxy Model, the magnitude of variation between wire center special study lengths and default proxy lengths is unacceptable. The special study data is a sensible method for validating the reasonableness of the customer location data in the models. Both models clearly fail this test.

223. In the case of the Hatfield Model, the model's estimated loop lengths for GTE and U S WEST, when considered in their entirety, is less than the loop lengths reported by the Companies. Conversely, the BCPM reported loop lengths exceed on average the distances reported by the Companies. AT&T's December 17, 1997 Response to Bench Requests; BCPM folder Misc. Table Inputs, version of model provided in response to bench request.

224. In response to a Commission bench request, the proxy model developers modified their models so they could use the wire center and loop length data provided by U S WEST and GTE. This involved two steps. For each wire center, a loop length factor was computed by dividing the models' average loop length for that wire center by the Companies' average loop length. On a wire center by wire center basis, all distance-related loop investments were divided by this factor. AT&T's Response, p. 2; Sprint's November 21, 1997 Response to Bench Request.

225. GTE and U S WEST also provided data on wire center counts. This information was used by the Hatfield Model developers to adjust the wire center loop counts in their models. AT&T's Response, p. 2. It does not appear that Sprint made a similar adjustment in the BCPM. Sprint's Response.

226. We have used the revised versions of the proxy models to determine the cost of the loop. In light of the large differences in loop lengths discussed, *supra*, at paragraph 221, we believe the reasonableness of the costs are greatly improved by these modifications.

227. In future proceedings, we will require proxy model sponsors to address the relationship between the study's average loop length estimates and the ILEC's actual average loop length, as well as the similarity in wire center line counts. We note that the FCC has recently expressed great interest in this data in a recent notice: *State Forward-Looking Cost Studies for Federal Universal Service Support*, CC Docket Nos. 96-45 and 97-160, DA 98-217, February 27, 1998.

#### **M. Expense Factors**

228. The Hatfield Model estimates some expenses based upon expense-to-

investment ratios derived from the ILEC's ARMIS reports. For example, if historically there is five cents of maintenance expense for every dollar invested in buried cable, the Model assumes that prospectively the same ratio would hold in the future. When certain expenses are deemed more sensitive to the number of customers, expense factors take the form of ARMIS expense divided by ARMIS reported number of lines. Exh. 29, Hatfield Model Release 3.1: Model Description, February 28, 1997, at 55.

229. GTE criticizes the use of such ratios as being too simplistic and failing to take into account that factors other than investment or the number of lines may be causing the expenses to be incurred. GTE Brief at 70-71.

230. While GTE criticizes the use of expense-to-investment ratios and suggests that there may be a better alternative, the Company did not propose any substitute formula that could be used when re-running the model.

231. GTE also disagrees with the assumption made in the Hatfield Model that forward-looking operations expenses can be approximated by applying a factor of 50% to its current booked expense.

232. Network operations include the expenses associated with the provisions of power, network administration, testing, plant operations administration, and engineering. Exh. 47, MAC-2, Tab 6.

233. The Hatfield Model relies upon ARMIS data, a publicly available source for expense data. AT&T contends that, in order to make these historical figures forward-looking, the Model should reduce the current ARMIS-reported network operations expense by 50%. The adjustment is designed to reflect the opportunity to realize reductions in this expense as labor is substituted for capital. For example, the Hatfield Model assumes that by deploying a digital cross-connect system, labor expenses would be reduced. Exh. 40, RAM-2, at 74-75; Tr. 390.

234. AT&T also notes that the assumption of a 50% savings is consistent with the default expense values used in the BCPM. Overall, the BCPM sponsors use a 40% reduction in operating expenses, relative to the ARMIS values. AT&T Brief at 57.

235. Whereas the Hatfield sponsors assume the network operations expense to be \$1.79 per line, the BCPM uses a lower value, \$1.33 (Account 6530). Exh. 46, WLF-2, Table 5; BCPM, folder Expense Inputs. The BCPM value is based upon a national survey of local exchange companies. The survey instrument asked the local exchange companies what were their forecasted forward-looking expenses. Tr. 1212. Neither U S WEST nor GTE challenged the reasonableness of the BCPM's operations expense input value.

236. U S WEST argues that the Hatfield Model's 50% expense reduction should not be adopted, because it does not reflect data analysis of the Company's Washington operations. U S WEST Brief at 56.

237. GTE concurs with U S WEST. GTE points out that they have been unable to validate the forecasted 50% expense reduction. GTE Brief at 71-72.

238. Commission Staff supports the adoption of the 50% discount for network operations. They contend that the recent experience of local exchange companies does not accurately reflect long-run economic cost conditions. Commission Staff Brief at 34; Tr. 1625.

239. We conclude that, based upon the evidence of record in this proceeding, the Hatfield operations' expenses should not be set at 50% of the current level. While we accept that there will be some efficiency gains, we believe a 30% assumption to be more reasonable. This reduction is consistent with the BCPM survey results and U S WEST's assertion that these costs will be declining over time. U S WEST Brief at 56. We view the BCPM survey results as supportive, but they cannot be determinative of this issue. As the survey responses are not publicly available, we have given less weight to these results than we would had they been in the public domain.

240. The lack of data to support the BCPM or Hatfield Model proposed network operations expense input values highlights the need for parties to provide studies that can be independently validated. As with many other contested issues in this case, parties have made conflicting claims regarding cost levels that would be incurred by efficient telecommunications service providers. Such conflicts are best resolved by subjecting the claimed values to some form of validation or, where data cannot be compared to the recent experience of efficient firms, careful analysis of the study methodology and assumptions. We will require sponsors of future cost studies to provide a well-documented study to support their positions.

241. U S WEST's operating expense factors include maintenance, administration, marketing expense, product management, and sales expense. The network operations' factor includes the expenses associated with providing power, network administration, testing, plant operations, administration, and engineering. U S WEST stated that its operating expense factors have been adjusted to reflect anticipated cost savings. U S WEST Brief at 56; Tr. 2036-2047.

242. U S WEST's maintenance factors are determined by dividing the prospective account expense by the current value of the investment. Tr. 2042. GTE's maintenance factors, on the other hand, appear to be based upon the ratio of current

expenses to embedded investment. Exh. 31 at 14-15. To the extent that GTE's models are based upon this historical ratio, we find that future studies should reflect the methodology used by U S WEST. This would require GTE to adjust its expenses to reflect anticipated productivity gains and to divide the current expenses by current or future investment levels, not the embedded value.

243. We are unable to adjust GTE's expense factors in this case because the necessary data is not part of this record. In future cases, we will require parties to provide studies that reflect both forward-looking technology and the costs associated with such facilities. We are concerned that both the GTE model's and the Hatfield model's use of embedded expense-to-investment ratios may not provide a reasonable prediction of future expense levels.

#### **N. Joint, Shared, and Common Costs**

244. Joint, shared, and common costs are expenses that are not attributable to a particular service, nor to a family of products.

245. The FCC defines joint and common costs as follows:

Certain types of costs arise from the production of multiple products or services. We use the term "joint costs" to refer to costs incurred when two or more outputs are produced in fixed proportion by the same production process (*i.e.*, when one product is produced, a second product is generated by the same production process at no additional cost). The term "common costs" refers to costs that are incurred in connection with the production of multiple products or services, and remains unchanged as the relative proportion of those products or services varies (*e.g.*, the salaries of corporate managers). Such costs may be common to all services provided by the firm or common to only a subset of those services or elements. If a cost is common with respect to a subset of services or elements, for example, a firm avoids that cost only by not providing each and every service or element in the subset. For the purpose of our discussion, we refer to joint and common costs as simply common costs unless the distinction is relevant in a



particular context.

CC Dockets 96-325 and 96-98; CC Docket 95-185 (August 8, 1996), ¶676.

246. Shared costs are expenses that are common to a family of products but are not avoided if one of the products is eliminated. Common costs are shared costs where the family of products is the total operations of the firm.

247. We will follow the convention of the FCC and refer to joint, shared, and common costs as simply “common costs.”

248. The parties have advocated different methods for recovering common costs. AT&T/MCI and U S WEST have submitted cost studies that include cost factors that are designed to account for these common costs. These parties allocate common costs by applying a fixed allocator to the directly attributable forward-looking costs.

249. Sprint also supports the use of a fixed allocation method for the recovery of common costs. Sprint Brief at 13. The cost model that it has sponsored, the BCPM, does not use this method. Rather, it assigns overhead costs on a per line basis.

250. GTE, WITA, TCG/NextLink, and Commission Staff, on the other hand, recommend against employing a common cost factor to the directly attributable costs. These parties contend that a cost study should be used to establish a price floor for products and not a revenue requirement. Commission Staff Brief at 7; GTE Brief at 72; WITA Brief at 11-12; TCG/NextLink at 18.

251. The Commission concurs that the recovery of common costs is a Phase II pricing issue and therefore we have excluded this expense from the Hatfield Model, BCPM, and the US WEST loop study. Common costs were not included in GTE’s cost models. Parties are directed to present testimony in Phase II of this proceeding on 1) the level of common costs that should be recovered through the price of UNEs; and 2) how individual prices should be established (*e.g.*, a “mark-up” that is inversely or directly proportionate to the elasticity of demand). We also direct parties to make specific tariff recommendations.

252. Commission Staff also contends “that a factor of 20% be added to the TELRIC loop estimate to account for costs that are not attributed to particular unbundled elements, but are nevertheless part of a proper TELRIC analysis.” Commission Staff Brief at 35.

253. Commission Staff’s Brief does not provide a citation for the 20% factor, but it appears to be based upon U S WEST’s claim that there should be a 20% additive for attributable costs. The 20% value was derived from a U S WEST study. Exh. 104 at 26.

254. U S WEST's loop study includes an allowance of 20% for attributable costs. Commission Staff substituted this 20% value for the Hatfield's Model default loading factor of 10.4% for common overhead costs. Exh. 104, TLS-3, at 3.

255. Commission Staff did not indicate whether or not, for the BCPM and GTE models, there also should be a 20% mark-up for attributable costs.

256. In our running of the Hatfield Model, we use a zero value for common overhead costs, rather than Commission Staff's 20% input value. We have not adopted Staff's recommendation for the Hatfield Model because we are concerned that the 20% loading factor may be associated with costs that are captured elsewhere in the model.

257. We direct Commission Staff and other parties to address in Phase II the need for including in the price of the loop a mark-up for the 20% factor contained in Staff's testimony.

#### **O. Loop Summary**

258. The parties recognize that their cost studies are imperfect and they are in the process of revising them. Tr. 348 (AT&T), 1095-96, 1099-1102 (GTE), 1234 (Sprint), and 1849 (USWC).

259. TCG/NextLink suggests that the Commission focus on establishing the right price for unbundled network elements. TCG/NextLink contends that the Commission should not select a single model; rather, it should use the collective information found in the evidence of record to estimate the efficient costs of interconnection and unbundled network elements. TCG/NextLink Brief at 14-15.

260. TRACER argues that if the Commission does not select a model, "the various provider parties will simply be encouraged to continue to exhaust the Commission's, and others', resources examining the latest iteration of a gamed model designed to promote and disguise a particular company's strategic objectives." While it recommends that the Hatfield Model be adopted, TRACER finds the model to be "flawed" and suggests that it "be modified both with respect to its algorithm[s] and its inputs[.]" TRACER Brief at 8-9.

261. We disagree with TRACER regarding the efficiency of adopting the Hatfield Model. Accepting that the model needs to be modified, there is no basis for concluding that the redesigned Hatfield Model would be a better starting point in subsequent cases than any of the other revised models.

262. We agree with TCG/NextLink that prudence dictates that no single model be adopted at this time. In light of the current revisions being made to the models and the speed with which upgraded versions of the models are being introduced, we find that the loop models filed in this proceeding provide only a range of reasonableness. Our conclusion also is consistent with the position advocated by U S WEST witness Reynolds: “[W]e advocate that the Commission look at a number of different data points[.]” Tr. 1849.

263. Subsequent to the close of the record in this proceeding, revised versions of all of the loop models have been released by the sponsors. The Hatfield Model version 3.1 and the Benchmark Cost Proxy Model version 1.0 have been sponsored and challenged in this proceeding. In the intervening months prior to this Order, the model sponsors have released at least two new versions of each model. U S WEST’s loop model, RLCAP, has also been revised. GTE has developed a new loop model, ICM. The model sponsors assert that these newer versions provide greater transparency, are more user friendly, and address some of the criticisms made of the versions of the models sponsored in this proceeding.

264. We see little or no advantage in adopting any of the loop models sponsored in this proceeding. The critics have shown that the existing models have a combination of flaws. For example, GTE’s loop model adjustment for spare capacity is seriously flawed because the wrong size facilities are used to develop unit costs. Furthermore, the model is closed and inflexible. The Hatfield Model has algorithmic errors, the assumed level of sharing is unreasonable, and the method used to validate the cost of installing outside plant facilities is seriously flawed. U S WEST’s loop model is inflexible, closed, and uses inputs for buried cable and utilization rates that are inconsistent with its actual operations. Finally, the BCPM inputs are based upon a proprietary study of LEC operations, thus violating the Commission’s requirement for the use of open models, its use of per line expenses for outside plant is not economically sound (Exh. 31 at 28), and it has at least one algorithmic error.<sup>24</sup> Tr. 1209-1212.

265. In light of these problems, we believe that the models proposed in this case provide only a zone of reasonable cost floors. In the next section of our decision, we review the results of running the different models after we have made the changes identified above.

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<sup>24</sup> Sprint does not propose a correction for the error. The error is associated with the calculation of taxes. Sprint proposes that the model’s calculations be ignored and that annual charge factors be substituted for the models’ CAPCOST program. Tr. 1209-1212. Unfortunately, there is no reasonable, open, CAPCOST program that is part of the evidence of record in this proceeding.

## P. Loop Costs

266. In the Table, *infra*, we provide the loop costs obtained from the different models.

267. There were a number of changes that we are unable to make to the models because they do not exhibit sufficient flexibility. For example, the RLCAP does not permit the user to adjust the cost of money or the depreciation. Rather, in order to undertake sensitivity analysis with the model, a user needs to have access to U S WEST's main frame program, CAPCOST.

268. Whereas the CAPCOST program was not part of the evidence of record, we have used the filed version of RLCAP that reflects prescribed depreciation rates and a 9.37% cost of money. If we were able to access CAPCOST, however, we do not believe our costs would change significantly. We note, for example, that if the cost of money in the default version of the Hatfield Model is increased from 9.37% to 9.63%, U S WEST's estimated monthly loop cost increases by 1.6%.

269. The following Table summarizes our findings regarding U S WEST. On the first line of the Table are the costs reported by the different models after we make the changes we describe fully above. There are a few areas in which we could not modify the models to comport to our findings. In those instances, we indicate the likely impact on the loop cost. Based upon the evidence of record, we find that the cost of the unbundled loop is \$17.00.

	Hatfield	BCPM	RLCAP
Commission's run of the model	\$13.53	\$17.23	\$13.76
Placement Costs	Increase Cost, ¶98		
Load Coils	Increase Cost, ¶14513026813020413016413098		
Load Coils	Increase Cost, ¶145		
Special Access Lines	Increase Cost, ¶204		
Impact of Competition	Increase Cost	Increase Cost	Increase Cost

Fill Factor			Reduce Cost 8.7%, ¶185
Drop			Reduce Cost \$0.69, ¶116
Calculation of Unit Costs			Reduce Cost, ¶188
Structure Sharing			Reduce Cost, ¶68

270. The following Table summarizes our findings regarding GTE. On the first line of the Table are the cost estimates reported by the different models after we make most of the changes we describe fully above. There are some areas in which we cannot modify the models to comport to our findings. In those instances we indicate the likely impact on the loop cost. Based upon the evidence in the record, we find that the cost of the unbundled loop is \$20.00.

	Hatfield	BCPM	GTE LTM filed <sup>25</sup>
Commission's run of the model <sup>26</sup>	15.73	24.18	25.03

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<sup>25</sup> Exh. CC-64 at 55. GTE filed cost of \$31.22, less adjustments for depreciation and an 11.25% cost of money.

<sup>26</sup> We are unable to run the GTE loop model and therefore only provide the results contained in its cost witnesses' testimony.

Placement Costs	Increase Cost. ¶98		
Load Coils	Increase Cost. ¶145		
Special Access Lines	Increase Cost. ¶204		
Impact of Competition	Increase Cost	Increase Cost	Increase Cost
Fill Factor			Reduce Cost 8.7%. ¶185
Drop			Reduce Cost \$0.69. ¶116
Calculation of Unit Costs			Reduce Cost. ¶188
Structure Sharing			Reduce Cost. ¶68

## **VI. DEAVERAGING COSTS**

271. Commission Staff contends that questions of how and the extent to which network element costs are calculated on a deaveraged basis should be addressed in the context of universal service reform, deaveraged retail prices, and the extent of competitive activity in Washington State. Staff is concerned that if loop costs were deaveraged without a universal service fund mechanism in place to accommodate the cost shift, subscribers might be forced to leave the network. Commission Staff Brief at 54. U S WEST, Public Counsel, WITA, and GTE also expressed their opposition to rate deaveraging at this time. U S WEST Brief at 95; Public Counsel Brief at 47; WITA Brief at 27; GTE Brief at 97. TCG Seattle supports the deaveraging of rates, noting that this is a requirement established by the FCC, and that it is unlikely U S WEST would be permitted to provide interLATA services until its rates have been deaveraged. TCG/NextLink Brief at 27-28.

272. AT&T/MCI and Sprint argue that, from an economic perspective, deaveraging is appropriate because it will lead to rates which more closely reflect the cost of providing UNEs and interconnection. If rates are not deaveraged, uneconomic entry may occur in low cost urban areas and efficient entry in rural areas may be prevented. AT&T/MCI Brief at 83-84; Sprint Brief at 82-84.

273. The FCC's Interconnection Order requires state public utility commissions to establish a minimum of three geographically deaveraged pricing zones for unbundled network elements. FCC Interconnection Order at ¶765. In light of the Eighth Circuit decision, we are not bound to follow that provision of the FCC Interconnection Order.

274. We choose not to deaverage UNE and interconnection rates at this time. We agree with Commission Staff and the other parties who argue that it is more appropriate to consider this issue in the context of universal service reform, deaveraged retail prices, and the extent of competitive activity in Washington State.

## **VII. COST OF SWITCHING**

### **A. Cost Structure**

275. The Hatfield Model computes switch investment on a per-line basis. According to AT&T/MCI, the unbundled switch network element, by definition, includes all the features, functions, and capabilities of the switch, including its vertical features. 47 C.F.R. §51.319(c)(1)(C)(1) & (2). AT&T Brief at 61.

276. In defining the switch element, the FCC concluded: "Thus, when a

requesting carrier purchases the unbundled local switching element, it obtains all switching features in a single element on a per-line basis.” FCC Interconnection Order, ¶412. The FCC’s definition of the switch element and that portion of its First Report and Order cited above remain in full force and effect. *Iowa Utilities Board v. FCC*, 120 F.3d 753 (8th Cir. 1997) (Eighth Circuit decision).

277. AT&T argues that the tariff rate for the switch should be set in a manner consistent with the FCC’s findings. Under AT&T’s proposed rate structure, the rate would be independent of the number of vertical features used by AT&T and the retail subscriber.

278. GTE expresses concern that if the marginal price of switch features is zero, its processors would experience exhaust prematurely and therefore require additional investments. GTE Brief at 73.

279. We find GTE’s concern unconvincing for several reasons. Even if the tariff rate to CLECs for vertical features is zero, this would not mean, as GTE presumes, that the retail price would be zero.<sup>27</sup> Since the CLECs are not likely to give the service away free of charge, GTE’s concern about congestion is based upon an unreasonable assumption. GTE proposes a pricing structure with different charges which varies depending upon the switching features selected. GTE expresses the concern that if its proposed rate structure is not adopted, it would be compelled to re-size its processors “to reflect the more intensive use of the switch features.” GTE does not present any evidence to suggest that its processors are near exhaust. Instead, its cost study suggests that its processors’ utilization is not likely to exhaust in the foreseeable future. Exh. C-67 at 8-9; GTE Response to Bench Request Set One, Number 7; GTE SCIS Study Level Input Statistics Report, Processor Utilization, page 000309.<sup>28</sup> Paradoxically, GTE’s cost estimate for vertical features reflects the assumption that the frequency of usage of a feature is the same for an unbundled network element as it is for retail services. GTE Response to Bench Request Set One, Number Four.<sup>29</sup> This presumption contradicts the company’s assertion that a customer of a CLEC would use vertical features more often than would retail customers.

280. Charging for vertical features is also inconsistent with the manner in which

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<sup>27</sup> “If GTE is required to offer unlimited use of its switch on a per line, flat rate basis, the CLECs will have an incentive to price their services in such a way so as to promote maximum usage of GTE’s switch.” GTE Brief at 73. Maximum usage would occur at a price of zero.

<sup>28</sup> Neither did U S WEST provide data which suggests that its processors are nearing exhaust. BCH 01-0008.

<sup>29</sup> The same assumption is made by U S WEST. BCH 01-0005. As there are economies of scale in the usage of vertical features, and if GTE is correct that the usage of vertical features would be higher for vertical elements, GTE’s study overstates the unit cost of using unbundled network elements.



the equipment is currently acquired. Rather, the inclusion of features in the cost of the port is consistent with the structure of the ILEC's contracts with their vendors. See, for example, U S WEST's Response to BCH 02-0001; GTE Response to BCH 2-001; Tr. 1152-53.

281. Neither GTE nor U S WEST provide a compelling reason to establish a separate charge for vertical features. Their cost estimates are based upon closed models and the reported costs reflect a cost structure that is not observed in their contracts with their suppliers. Therefore, in this proceeding, we will not establish a separate charge for vertical features.

282. We do not rule out the possibility that in some future proceeding, a separate charge for vertical features could be established. For example, a party may be able to show through regression analysis that the investment per line, all else remaining equal, is higher at locations where a centrex-type service is provided. This type of regression analysis can be done using data that is not subject to the restrictive proprietary claims placed on the ILEC's switching models. The analysis could provide useful insight into the question of the degree to which vertical services require more investment than ordinary voice services.

## **B. Cost Levels and Selection of Switching Model**

283. The Hatfield Model proposes that switching investment per line be estimated by analyzing four data points. The investment per line for the regional Bell operating companies (RBOCs), GTE, and the independent LECs was derived from the Northern Business Information (NBI) publication, *U.S., Central Office Equipment Market: 1995 Database*. A fourth value for large switches of 80,000 lines was developed from an unnamed industry source. The number of central office lines was obtained from ARMIS data. Exh. 40, Hatfield Model: Release 3.1, Model Description, at 42.

284. GTE objects to the analysis. Specifically, GTE points out that 1) the line and cost data were obtained from two different sources; and 2) one of the four data points was not documented. GTE Brief at 74-76.

285. We concur with GTE that absent a showing that the switch sizes used in the Hatfield regression analysis were comparable in size to the average size switch installed by the RBOCs, GTE, and the independent LECs, it was inappropriate to match data on 1995 switch purchases with ARMIS data on switch sizes. With regard to the undocumented data point, it is unacceptable to use data from an unverifiable conversation with an unidentified switch vendor. For these reasons, we will not use the Hatfield inputs to determine the level of switching investments.

286. GTE filed results from its SCIS cost studies, but the Company

emphasizes that the cost estimates are “for illustrative purposes only.” The Company explains that “[t]he estimates are based on the most current inputs available and the [current] costing methodology . . . GTE reserves the right to present new cost estimates in subsequent phases of this proceeding.” Exh. 64 at 54.

287. This proceeding has two phases, only two phases, and was initiated by an Order clearly defining the two phases of this proceeding: “First is a ‘generic’ investigative proceeding relating to the development of an appropriate and consistent cost methodology to determine costs of providing certain telecommunications services. The other two matters are investigations . . . to determine . . . the proper level of prices for interconnection, unbundled network elements, transport and termination, and resale.” Therefore, we will not accept the filing of any new GTE cost studies that reflect its more recent thinking regarding input values and costing methodology.

288. We also find the GTE switching cost study to be unacceptable because of inadequate documentation. The Company has provided a computer printout of its study, but the documentation does not include page cross-references.<sup>30</sup> Without cross-references, it is not possible to see how information is transferred from one part of the study to another.<sup>31</sup>

289. We also disagree with some of the SCIS’s costing methodology. For example, SCIS includes a cost element called excess CCS Capacity Investment per line. GTE Document Page 000343. GTE explains that “[e]xcess CCS Capacity Investment is that portion of the traffic sensitive investment not recovered by actual usage. It occurs when the input CCS per line, that is the actual usage, is less than the adjusted capacity breakpoint CCS per line. It recovers the investment of the unused LCM (line concentration module) CCS not recovered by the Usage Investment component. Excess line CCS is spread across all line terminations to recover that investment.” GTE Response to Bench Request 2-003.

290. Traffic sensitive investments should be recovered from traffic sensitive rate elements. The line on a switch is classified as a non-traffic sensitive investment. SCIS’s assignment of residual traffic sensitive costs to lines does not make economic sense. Traffic sensitive costs should be recovered from traffic sensitive rate elements.

291. GTE points out that SCIS can produce both marginal and average costs.

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<sup>30</sup> The U S WEST cost studies do a better job of identifying the source for the different values which appear on its computer printouts. See, for example, Exh. C-115, U S WEST 1996 Local Interconnection Usage Costs, Washington, August 1996, at 5 of 19.

<sup>31</sup> GTE also provided a spreadsheet version of its switching cost study, but this too provides insufficient documentation. For example, we tried to determine how GTE estimated the cost of the two-wire basic port. In the Lotus spreadsheet, Exh. 65, watelric.wk4, folder MiscFeatSum, line 13, the cost -- less billing, collection, and directory costs -- appears, but it is not possible to determine how this value was derived.

If the former option is selected, unit costs are developed by dividing a facility's cost by its capacity. If the latter option is employed, the unit cost is developed by dividing the cost by the level of demand. In this proceeding, GTE used the marginal cost study approach. Exh. 67 at 9-10; Tr. 1147.

292. The selection of the marginal cost approach in the switching study is inconsistent with the method GTE proposes for loops: "GTE advocates the use of a composite actual fill, which is the actual level of utilization for both feeder and distribution plant." GTE Brief at 63. If GTE had used the average cost option in SCIS, the method would have been consistent with the approach used in its loop study.

293. Since the actual level of demand will be less than the capacity of the facilities, theoretically GTE's methodology has the potential to lead to an under recovery of the total cost of a facility. This would likely occur because the unit cost developed under the marginal cost approach times the actual level of demand will generate a level of revenue that is less than the total cost-of-production.

294. The SCIS Model developer, Bellcore, requires persons who do not have a contractual relationship with it to sign a confidentially agreement different than the Commission's standard agreement for protecting parties' proprietary information. Bellcore does not believe that our standard protective agreement provides adequate protection. As noted by Public Counsel, in Docket No. UT-950200, we believe that public models are preferable. Public Counsel Brief at 26. In that proceeding, we noted that the public should be provided with the opportunity to review our basis for establishing rates. We added that "[i]n some cases . . . secrecy may be necessary, but it certainly should be avoided where reasonable alternatives exist." Fifteenth Supplemental Order, Docket No. UT-950200 (April 11, 1996) at 86.

295. The U S WEST switching estimates were derived from its internal, proprietary switching module, SCM.<sup>32</sup> U S WEST Brief at 62-65.

296. Commission Staff attempted, but was unable, to verify the switch prices that were used as inputs to the GTE and U S WEST switch models. Exh. 104 at 10-11; Exh. 106 at 5.

297. Many parties urged the Commission to maintain our policy that models be "based on public data and an open process, so that any interested person can determine what data is used and how it is used." Shared Communications Services Brief at 1. See, also, for example, Public Counsel Brief at 26-27; AT&T/MCI Brief at 62-

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<sup>32</sup> Relative to the GTE and Hatfield switching algorithms, the record contains little discussion of the U S WEST cost models. AT&T/MCI notes that they were unable to run the U S WEST switch model. Brief at 65.

63. A preference for models that are in the public domain is a criterion accepted by other public utility commissions. In explaining its decision not to use proprietary cost models, the Nevada Public Service Commission stated that it “does not believe adopting a proprietary model for the purposes of developing costs for UNEs is consistent with the FCC criteria. (Universal Service Order, ¶250(8) and (9)). The Commission believes there are benefits to adopting a public model, including availability, verifiability, and replicability.” *In re Petition by Regulatory Operations Staff for Investigation into Procedures and Methodologies to Develop Costs for Bundled and Unbundled Telephone Services and Service Elements in Nevada*, Docket No. 96-9035 (December 11, 1997), ¶51.

298. Since there are reasonable alternatives that do not rely on proprietary models for estimating the cost of total switching investment, we will not use either the SCIS or SCM Models for the costing of UNEs.

299. GTE argues that the most important reason for rejecting the Hatfield Model is because it fails “all external validity tests.” To illustrate this claim, GTE notes that “The [Federal Communications] Commission Staff to the Joint Board calculated the 1995 fixed [investment] of a switch to be \$185,374.00 and the 1995 per-line [investment] to be \$107.00.” GTE Brief at 76. The FCC Staff study is based upon an analysis of data that is in the public domain.

300. The average line size on a GTE switch is approximately 4,300 lines. GTE Response to Bench Request 1. If the fixed cost of \$185,374.00 is averaged over those 4,300 lines, the investment per line, according to the data identified in GTE’s Brief, is \$150.00 per line ( $185,374/4,300 + 107$ ). For the port alone, the GTE/SCIS studies suggest that the investment per line is approximately \$144.00.<sup>33</sup> Whereas GTE argues that the port constitutes approximately 50% of the total switch investment (Exh. 79, Attachment 1, at 30, and Attachment 2, at 25), the effective total investment suggested by SCIS would be approximately \$288.00, well in excess of the value which GTE suggests should be used to validate a model.<sup>34</sup>

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<sup>33</sup> See, Exh. 65, watelric.wk4, folder loopsum, cell d49 divided by folder loop\_bnf, sum cells e21 to e27. This quotient is multiplied by 12 in order to convert the monthly to a yearly value. The \$144.00 value is larger than the investment values reported in responses to Commission Bench Request 2-002. Unfortunately, because of the poor documentation, we are unable to determine the source of the difference.

<sup>34</sup> The New York Public Service Commission (NY PSC) recently declined to use the SCIS model because the cost estimates were unreasonably high. Like the FCC study cited by GTE, the NY PSC used data from the ILEC’s depreciation report to determine the current investment per line. *Opinion and Order Setting Rates for First Group of Network Elements, Joint Complaint of AT&T Communications of New York, Inc. et al. Against the New York Telephone Company and Sections of New York Telephone Company’s Tariff*, Docket 95-C-0657 (April 1, 1997) at 84-86.

We note too that the port cost report by GTE is more than twice the cost estimated by U S

301. GTE contends that SCIS should be used because it properly captures the “drivers” that determine the engineering rules and design specifications of commercially available switches. GTE witness Tucek claims that SCIS reflects that there are many cost drivers on a switch besides lines, and that engineers size the switching machine based upon additional cost drivers, such as busy-hour call attempts, busy-hour CCS, and feature mix. Exh. 67 at 2-7; Tr. 1153-54.

302. We concur that conceptually SCIS is a rich model that uses many different cost drivers to size a switch and to identify the level of investment. However, we do not accept the use of the model to estimate switching investment and expense for several reasons: the reported cost levels are not reasonable (reference ¶300 immediately above); the model is closed (reference ¶298, *supra*); and we are concerned about the underlying costing methodology (reference ¶¶290, 293, *supra*).

303. The U S WEST switching cost model (SCM) also uses many cost drivers to estimate the level of switching investment and expense. Exh. C-115, U S WEST Communications Cost Manual, Volume I: Cost Methodology and Descriptions of Annual Cost Factors and Models, at 95-97.

304. We likewise will not accept the use of this model to estimate switching investment and expense. Like GTE’s SCIS, the U S WEST model is proprietary. As we stated above in paragraph 299, we will use reasonable non-proprietary alternatives whenever they exist.

305. Furthermore, the SCM cost estimates for a port with vertical features do not seem reasonable. U S WEST reports that the TELRIC for a port with custom calling, most standard Centrex features, and class services is \$5.31 per month. Exh. C-115, Analog End Office Line Port Recurring Costs, 1996 Cost Study, August 1996. If we assume an annual charge factor of 25%, this is equivalent to finding that the investment per line is approximately \$255.00. At the end of 1995, U S WEST had 1,312,658 equipped lines that were served through 110 wire centers. U S WEST Response to Bench Request Set One, Item 3, Attachment E. Assuming a 90% utilization level, this corresponds to approximately 10,740 working lines per switching machine. GTE has suggested that we use data from an FCC proceeding to validate the reasonableness of the switching investment estimates. Applying the validation test suggested by GTE, and summarized above in paragraph 300, the FCC data correspond to a prospective investment of approximately \$124.26 per line ( $185,374/10,740 + 107$ ). Based upon the application of the validation test urged upon us by GTE, the U S WEST estimated costs are not reasonable.

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WEST. Exh. C-117, Appendix 1, Table 1 & 2. Also, the SCIS investment is significantly higher than the U S WEST SCM port investment estimate. Compare GTE Response to Bench Request 2-002, with Exh. C-115, Analog End Office Line Port Recurring Costs, 1996 Cost Study, August 1996, at 5-2.

306. Moreover, we are concerned about the difference in cost suggested by U S WEST's incremental and embedded studies. The embedded SCM study suggests that the incremental cost of providing CLASS [services] is rather small. A different conclusion is reached however in the forward looking SCM study. Compare Exh. C-115, Analog End Office Line Port Recurring Costs, 1996 Cost Study, August 1996, at 4-1, with Exh. C-173, "Income Statement Across Products," Account 23500, line 34. As the cost of digital switching is generally declining (GTE Response to Bench Request Set One, Item 5), we find U S WEST's implicit conclusion to the contrary to be unreasonable.

307. Having found the switching investment estimates sponsored by GTE, U S WEST, and AT&T/MCI to be unreasonable, we have evaluated data provided in response to bench requests to determine the investment per line. GTE and U S WEST provided, for each of their switching centers, their embedded investment and the number of switched lines.<sup>35</sup> We converted the embedded investment to 1997 dollars using the telephone plant index for digital switching that was supplied by GTE.<sup>36</sup>

308. A few of the reported data points were excluded because the numbers seemed unreasonably low or high. After excluding these outliers, we found that for the remaining 243 observations, the average investment was \$205.03 per equipped line. This value is consistent with acquisitions made subsequent to 1994 -- \$207.77 per line.<sup>37</sup>

309. The investment per line generally declines as the number of lines on the switch increases. This occurs because the getting started cost of a switch is shared with a larger number of customers. Whereas U S WEST's average number of lines per switch is a higher value than the value for GTE, U S WEST's investment per line is lower. The average investment per equipped line is \$257.94 and \$186.37, respectively, for GTE and U S WEST.

310. Not all equipped lines produce revenue. In order to make an allowance for the difference between equipped and revenue-producing lines, we adjust the unit cost upward by eight percent. This adjustment raises the investment per line to \$278.58 and \$201.28, respectively, for GTE and U S WEST.

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<sup>35</sup> GTE Response to Bench Request No. 1, Item 1; U S WEST Response to BCH 01-003. GTE and U S WEST provided slightly different data.

<sup>36</sup> We did not use the U S WEST number because the values did not look reasonable and, because unlike the GTE numbers, U S WEST claimed that the data was proprietary. U S WEST Response to BCH 01-006; GTE Response to Bench Request No. 1, Item 5.

<sup>37</sup> If the outliers are included, the average investment for entire data set and for post-1994 is \$213.12 and \$109.35, respectively.

311. The GTE value calculated in the prior paragraph is quite high and is inconsistent with the FCC formula that GTE proposes be used to validate the reasonableness of switching investment values. The FCC data analysis suggests that a value of approximately \$150.00 is more appropriate. The \$257.94 is also out of line with the contract data provided in GTE's Response to Bench Request no. 1, Item 1. Similarly, the \$201.23 value for U S WEST is inconsistent with the information provided by U S WEST in its response to BCH 02-001.

### **C. Loop Summary**

312. Based upon our evaluation of data provided by the ILECs in response to various bench requests, including their vendor contracts, as well as the [FCC] Joint Board Staff switching investment analysis cited by GTE, we conclude that a reasonable value to assign the investment per working line is \$150.00.<sup>38</sup> We will use this value for both GTE and U S WEST. While we recognize that historically the unit cost per line declines as the size of the switch increases, the vendor contracts provided by GTE and U S WEST indicate that the industry has moved to a per line charging mechanism in recent years.

313. The Hatfield Model assigns 70% of the cost of switching to traffic and the remaining 30% to the port. Exh. 40, RAM-3, at 75. This valuation was not challenged by the other parties.

314. We agree with AT&T that the rate structure for switching should have two elements, a port (non-traffic sensitive) charge and a usage (traffic sensitive) fee; the investment per line must be assigned to both. Data contained in GTE's depreciation studies suggests that the portion of traffic sensitive investment may be somewhat lower than 70%. The depreciation studies suggest that the port related investment could be as high as 60%. Exh. 79, Attachment 1, at 30, and Attachment 2, at 25. For costing the switch, we will assign 45% of the cost to the port.

315. Based upon our findings of a switching investment of \$150.00 per line and that 45% of the cost is associated with the port, the port and traffic-sensitive investments are \$67.50 and \$82.50, respectively.

316. The non-port investment can be converted to a per minute charge through a two-step process. First, the busy-hour investment is converted to a daily investment by dividing the expenditures by the percentage of daily usage which occurs during the busy hour. Then the investment is annualized by dividing the daily cost by the number of business days, plus some additional days for weekends. U S WEST Response to Bench Request 01-0009; Exh. 40, RAM-3, inputs B93 and B94.

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<sup>38</sup>This value is higher than the investment level reported in the contracts because the contract values do not reflect such miscellaneous investment costs as telephone company engineering, power, and the main distribution frame.

317. Based upon the data provided by GTE and U S WEST, we have converted the non-port investment to a minute-of-use cost. We did this by assuming that during the busy hour, the usage was five minutes per line.

318. We divide the per minute investment per line (\$82.50 divided by five minutes), by 2,776 (GTE) and 3,296 ( U S WEST), respectively. GTE Response to Bench Request No. 1, Item 8, file WAUSAM.WK4, folder main, lines; U S WEST Response to Bench Request 01-0009. The per minute investment is \$0.00594 for GTE and \$0.00501 for U S WEST.

319. Investments can be converted to a monthly cash flow requirement through the application of annual charge factors. Unfortunately, none of the models provide a transparent, economically rational, method for modifying annual charge factors in a manner that is consistent with our findings in this Order. Therefore, we will use a factor of 22.95% for digital switching. This value was derived from Exh. C-115, Analog End Office Line Port Study, Recurring Costs, Prescribed Lives, August 1996.<sup>39</sup>

320. Based upon the investment levels reported above in paragraph 317, and a digital switching annual charge factor of 22.95%, we find that the monthly cost of the port is \$1.29, and the per minute cost of a switch is \$0.00136 and \$0.00115, respectively, for GTE and U S WEST.

## VIII. AVOIDED COSTS

321. The Act requires that incumbent LECs facilitate competition by reselling telecommunications services. The Act states that “[f]or the purposes of section 252(c)(4), a State commission shall determine wholesale rates on the basis of retail rates charged to subscribers for telecommunications services requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier.” 47 U.S.C. ¶252(d)(3).

### A. Services To Be Discounted

322. Commission Staff argues that the ILECs are required to calculate a discount for all services to be sold on a wholesale basis. They argue that the Act requires that all telecommunications services which are sold at retail must be sold on a wholesale basis. The Act does not distinguish between regulated and non-regulated services, nor does it exclude those retail services sold at a discounted rate. Commission Staff Brief at 36.

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<sup>39</sup> The U S WEST calculation was adjusted to reflect the exclusion of common costs and the right-to-use fee. Whereas the cost of the software is included in the purchase price of a new switch, we find that it is inappropriate to include the software expense as part of the annual charge factor. GTE's Response to Bench Request Set One, Number One; U S WEST's Response to Bench Request BCH 02-001.



323. U S WEST states that the only services that should be discounted are intrastate telecommunications services which are provided at retail prices. U S WEST specifically identifies carrier access service as a non-retail service. They also state that deregulated, enhanced services, such as voice mail; E\*9-1-1; pay phone; RCC/Cellular/Wireless interconnection services; and billing and collection services are products that should not be included within the discount. While no party specifically disagrees with U S WEST, the Company does indicate that cost models supported by some of the parties do not exclude these services. U S WEST Brief at 67-68.

324. The issues raised by U S WEST are not whether this Commission should set discounts for particular services, but rather how to construct a model that will accurately determine the proper discount rates for those services. The Commission finds that all retail telecommunications services should be discounted, including both those that are currently offered at a discount and those that are deregulated. The Commission does note U S WEST's acceptance that services such as Centrex are properly included within this analysis. U S WEST Brief at 67. We agree with U S WEST that §252(d)(3) does not require the selling of enhanced services at a wholesale discount.

#### **B. TSLRIC or Embedded Cost Studies**

325. With the exception of U S WEST, all parties have proposed the use of embedded cost-of-service studies. Commission Staff argues that embedded cost-of-service studies are appropriate because the ILECs' revenue requirement was set to recover embedded costs. They note that TSLRIC has been used to determine the price floor, but not the actual rates, for some services. Staff's advocacy of embedded costs is consistent with its position that revenues should be used as the denominator in the calculation of the avoided cost discount. AT&T/MCI also claim that the fact that this Commission has used embedded costs to set rates argues for the use of an embedded "top down" cost study to determine the discount. Sprint points out that the FCC has said that ideally a state would use a study methodology consistent with the manner in which it sets rates. Both GTE and Public Counsel utilize embedded costs in their studies. U S WEST Brief at 68-69; Commission Staff Brief at 38; AT&T/MCI Brief at 69-70; Sprint Brief at 60.

326. U S WEST believes that it is more appropriate to use a TSLRIC study. They indicate that the FCC did not preclude the use of TSLRIC studies, and argue that the forward-looking TSLRIC studies properly measure the costs to be avoided. It should be noted that U S WEST also prepared an embedded cost-of-service study.

327. The Commission agrees with Commission Staff. This Commission has set rates to cover the separated embedded costs of U S WEST. Thus, the portion of costs that can be avoided can be determined directly from an analysis of those embedded costs.

### **C. Data Appropriate to the Cost Studies**

328. The first question on data concerns whether it is more appropriate to use total state data or separated data. The ILECs allocate their costs on a state-by-state basis, and, then, separate costs between intrastate and interstate operations. Interstate revenue requirement and rate design is made pursuant to the FCC's jurisdiction, and the Washington intrastate revenue requirement and rate design is under our jurisdiction. U S WEST urges that the separated information is the correct information to utilize. The Company contends that the Act requires that the discounts apply only to the intrastate revenue requirement. Commission Staff agrees using the same rationale urged by U S WEST. U S WEST Brief at 69; Commission Staff Brief at 44.

329. Public Counsel supports the use of separated data. They point out that the courts have made it clear that states have jurisdiction over rates for intrastate service. They claim that §410(c) of the Communications Act of 1934 establishes mandatory separations procedures for jurisdictional allocation. Thus, while AT&T may not like the separations, it is inappropriate to include interstate costs in intrastate operations. Public Counsel identifies specific concerns with AT&T's attempt to perform its own allocations. They contend that the studies utilizing Bell Atlantic's information or U S WEST's CAAS data are inappropriate. Public Counsel points to specific costs, such as the interstate loop costs and advertising, which AT&T allocated to intrastate operations. Public Counsel Brief at 29.

330. AT&T/MCI believe that the use of unseparated data is appropriate. They claim that the use of separated data allows the ILEC to collect costs which will not be avoided. These include advertising and marketing costs of which approximately 25% are allocated to the interstate jurisdiction. They point out that CLECs that utilize resale products to serve their customers would also incur these costs, but, unlike the ILECs, they would not be able to collect the subscriber line charge. As a result, the CLECs would incur costs for which they would not receive the discount enjoyed only by the ILECs. This would result in an artificial barrier to market entry. AT&T/MCI Brief at 67-68.

331. AT&T/MCI refers to a Massachusetts Department of Public Utilities determination that the use of separated data shifts avoided costs between jurisdictions, similar to the way in which costs have traditionally been shifted to the long-distance market. *Id.* at 69.

332. GTE states that the use of separated or unseparated data makes little difference because none of the interstate services would be subject to resale. Thus, none of the costs are avoidable. GTE Brief at 80-81.

333. The discount rate established in this proceeding will apply to rates which reflect jurisdictionally separated costs. There is no evidence in this record to support the conclusion that the costs allocated or attributed to the interstate jurisdiction are avoidable due to the termination of retail services subject to our jurisdiction. Neither is there evidence in this record how any specific avoided cost, to which AT&T/MCI objects, has been recovered through rates subject to the FCC's jurisdiction. Furthermore, it is inappropriate for this Commission to set discounts for interstate rates. We require the use of separated data in the calculation of the appropriate discount rate.

334. The parties contest whether it is acceptable to use company specific, and in some cases proprietary, data, in addition to ARMIS data. U S WEST supports the use of company specific data, whether proprietary or not. The Company uses their CAAS/CARS data to isolate costs associated with services that are not subject to a discount, and to allow for the measurement of service specific discounts. U S WEST believes that product specific allocations are similar to the allocations it uses, in that they spread costs among jurisdictions and between regulated and deregulated services, which have withstood the scrutiny of regulators and auditors. These allocations are not arbitrary, but based upon well conceived principles and documented methodologies. U S WEST argues that the simplicity of the AT&T or MCI studies fails to measure reality. It is only by reviewing the information in their CAAS/CARS systems that one can identify the costs which would actually be avoided. U S WEST indicates that while the information may be proprietary, it was available for review by the parties. U S WEST Brief at 69-71.

335. GTE also supports the use of company specific data. The Company argues that the ARMIS reports were not designed to analyze avoided costs in a wholesale environment and within each USOA (uniform system of accounts) item. GTE performs many of their functions at work centers central to their nationwide operations. GTE explains that it is necessary to look at each work center in order to determine the level of avoided costs for an account on a nationwide basis. These relationships are then applied to the Washington account total. GTE also indicates that the information, while proprietary, is readily available to the parties in the case. GTE contends that AT&T's analysis, which does not rely on information specific to GTE, is insufficient to obtain accurate results. GTE Brief at 78-82.

336. Commission Staff believes that use of publicly available information is preferable, but does rely on the company specific information provided by GTE and U S WEST in order to reduce costs related to the specific services they determine are not subject to the discount.

337. Public Counsel expresses a strong preference for the use of publicly available information, but, as with Commission Staff's study of GTE, Public Counsel utilizes proprietary information to remove the costs of OS/DA. Public Counsel Brief at 31-32.

338. Sprint supports the use of proprietary information when publicly available information is not adequate to identify expenses which are unavoidable in a wholesale market. Sprint Brief at 69.

339. AT&T/MCI claim that only publicly available data should be used. They indicate that the use of proprietary data puts the ILEC in complete control of the study, creating a “black box” model which reflects the sponsor’s sole opinion and is not verifiable. As a result, timely review by other parties and the Commission would be difficult. AT&T/MCI Brief at 70.

340. The Commission already in this Order has stated its preference for use of publicly available data wherever and to the greatest extent possible. However, it is important that the discount should reasonably represent the costs which are to be avoided. The use of a national proxy, which is not based upon company specific information, or ignoring evidence which indicates that costs will not be avoided, is unacceptable. Therefore, the Commission consents to the use of company specific and proprietary data, when other data are unlikely to provide reasonable and accurate results.

**D. Separate Discount Rates for Groups of Services or One Composite Discount Rate**

341. There appear to be three issues concerning the segregation of the wholesale discounts by product. First, whether directory assistance and operator services should be separated from the retail services’ base. Second, whether nonrecurring revenues should be separated from the retail services’ base. Third, whether the remaining retail services should be segregated between product lines.

**1. Operator Services and Directory Assistance**

342. U S WEST argues that operator services (OS) and directory assistance (DA) costs are not included within the costs of its other services, and, thus, should not be treated as avoided costs. The Company contends that if a reseller wants to avoid DA charges, they simply should not use the DA service. U S WEST argues it is unnecessary to include OS/DA in the discount, or to establish a separate discount, because there is already a wholesale rate. U S WEST Brief at 72-73.

343. GTE agrees with U S WEST and Commission Staff that OS/DA are separately tariffed services and should not be treated as avoided costs in the calculation of a wholesale discount. GTE Brief at 88-89.

344. Commission Staff points out that OS/DA are retail telecommunications

services, and, as such, are subject to the resale requirements. However, Staff identifies several ways in which OS/DA varies from other retail services: OS/DA are considered discrete unbundled elements; a majority of their costs is recovered through separate rates; and the services do not have to be purchased by resellers. For these reasons, Staff recommends that a separate discount be calculated for OS/DA. Commission Staff Brief at 42-43.

345. While it may appear that Commission Staff and U S WEST agree on OS/DA, U S WEST disagrees with Staff's treatment of directory assistance costs. The Company contests the \$16 million in Commission Staff witness Strain's calculation related to directory assistance. In her testimony, Ms. Strain states that the portion of directory assistance which is not recovered through directory assistance charges should be treated as avoided. This \$16 million figure appears to have come from Public Counsel witness Dunkle's testimony in which he identifies two separate discounts that depend on whether or not the reseller chooses to self-provide directory assistance. Commission Staff does not make the same adjustment on the GTE study, because they note that GTE's directory assistance rate appears to cover the total directory assistance cost. U S WEST Brief at 79.

346. Public Counsel argues for two separate discount rates -- one in which a reseller chooses to use U S WEST's OS/DA services, and one in which a reseller will obtain OS/DA from another source. When a reseller chooses not to utilize U S WEST for OS/DA, Public Counsel proposes to treat the directory assistance costs that are not covered through separate OS/DA charges as avoided. Public Counsel also excludes OS/DA revenues from the calculation. On the other hand, if a reseller chooses U S WEST to provide these services, then the costs are not treated as avoided, and the OS/DA revenue is included in the denominator for calculating the discount. Public Counsel Brief at 33-36.

347. AT&T/MCI contend they will self-provide OS/DA to their customers. U S WEST must make OS/DA available. Hence, the costs associated with these services must be treated as avoided costs. AT&T/MCI Brief at 71.

348. The Commission finds that OS/DA are telecommunications services, and, thus, are subject to resale. However, in so doing, we do not imply that one discount rate need apply to these services. Currently, U S WEST's residential telephone service includes one free directory assistance request monthly; the rate is \$0.60 for each DA request thereafter. U S WEST's business telephone service does not include a free DA request -- the rate is \$0.60 for all requests. The DA situation for both residential and business service was substantially different during 1995, the base year for the cost studies in this proceeding. In 1995, both residential and business telephone service included four free DA requests monthly, and paid \$0.25 for each DA request thereafter. The Commission's decision concerning the treatment of OS/DA must take these facts into consideration.

349. The AT&T/MCI position that 100% of these charges should be treated as

avoided costs simply does not comport with the facts. In U S WEST's case, the Commission believes that the substantial price changes in DA service have altered the relationship between OS/DA revenues and costs. The Commission concludes that the substantial shortfall in U S WEST's OS/DA revenue represented by Public Counsel witness Dunkel no longer exists. Commission Staff indicates that, in the case of GTE, revenues for OS/DA exceed costs and Staff thus made no adjustment to treat a portion of the OS/DA costs as avoidable. Exh. 147 at 8. The exhibits of Commission Staff and Public Counsel reflect the same conclusion regarding GTE. The Commission finds that OS/DA revenues should not be included in the calculation of an overall discount, and that none of the direct costs of these services should be treated as avoided costs. Both U S WEST and GTE should provide a separate study that calculates the avoided cost of providing OS/DA as recommended by Commission Staff. Commission Staff Brief at 43.

## **2. Nonrecurring Costs**

350. U S WEST argues that, like OS/DA, nonrecurring costs and charges should not be included in the avoided cost calculation. The Company claims that nonrecurring charges are not subject to resale since they are not "rates" insofar as the term is used in the Act. Furthermore, they indicate there are no avoidable nonrecurring costs associated with the retail environment. U S WEST is willing to calculate a separate discount for nonrecurring charges if the Commission finds it appropriate. U S WEST recognizes that they occasionally waive nonrecurring charges. U S WEST Brief at 73-74. GTE also argues that there are no avoided costs in the retail rates for nonrecurring costs. GTE accepts Commission Staff's proposal to exclude nonrecurring costs and revenues from the calculation. GTE Brief at 81.

351. Commission Staff favors excluding nonrecurring charges from the calculation of the overall wholesale discount. They indicate that the service ordering process will differ for retail and wholesale customers. Since this new service ordering process for wholesale customers is not yet in place, Staff believes that a separate discount would be appropriate until such time as it is. Commission Staff Brief at 43.

352. AT&T/MCI argue that, as with OS/DA, nonrecurring charges must also be included within the study, and the costs should be treated as avoidable. AT&T/MCI Brief at 71-72. AT&T's avoided cost study treats all customer service costs as 100% avoidable. These costs include a substantial portion of the cost related to nonrecurring charges. Public Counsel considers 90% of the customer service expense as avoidable cost, which includes those costs allocated to nonrecurring charges in the cost studies of U S WEST and Commission Staff.

353. We disagree with U S WEST's claim that nonrecurring charges should not be subject to the statutory resale provisions of §252(c)(4). Nonrecurring charges and recurring rates are used to recover recurring and nonrecurring expenses. As pointed out by U S WEST, the setting of nonrecurring charges involves, among other things, the consideration of the total costs associated with providing a service and with market demand. U S WEST Brief at 94. Just because a decision is made to recover costs through the payment of an up-front charge, does not exempt the rate from the requirements of §252(c)(4).

354. Having determined that nonrecurring charges are subject to resale, there remains the matter whether nonrecurring charges should be treated separately or as part of the overall discount.

355. U S WEST indicates there are no avoided costs associated with nonrecurring charges. U S WEST Brief at 74. We do not agree. It is unreasonable to assume that the time to process an order placed by a reseller will be identical to the time associated with a retail order. For example, the reseller will explain the various tariff options to the end-user and this will reduce the work effort by the ILEC. The reseller will also organize the transaction information in a manner which is convenient to the ILEC. This too should result in cost savings to the ILEC.

356. While the positions advocated by U S WEST and GTE understate the avoided costs, it also seems unlikely that 90%-100% of these costs can be avoided when these services are provided on a resale basis. We will authorize U S WEST and GTE to file separate discount rates for nonrecurring charges, and to exclude the revenues and costs associated with these services from the calculation of the wholesale rates for other products. Until such time however as GTE and U S WEST file, and the Commission approves, an avoided nonrecurring cost study, the Commission finds that a 50% avoided cost discount will apply to retail nonrecurring rates. The nonrecurring costs removed from the calculation of the general wholesale discount will be limited to the level of nonrecurring revenues removed from the calculation. Any remaining nonrecurring cost will be treated as direct avoided costs in the calculation of the general wholesale discount.

### **3. Segregation of the Discount by Product Line**

357. U S WEST proposes to create five separate discounts for five distinct groups of services. They claim that the costs that are avoidable vary substantially between these groups. As an example, they argue that marketing costs for some services, such as vertical services, are substantially greater than they are for residence services. Hence, they contend that it is inappropriate to utilize an aggregate discount when there is such a wide range in each individual product's avoided cost, capital cost, and margin. In its post-hearing brief, U S WEST accepts the proposal to establish the individual discount rates in the pricing portion of the proceeding. U S WEST Brief at 74.

358. Several parties utilize an aggregate discount approach, but do not object in principle to disaggregated discounts. GTE proposes a study that would calculate a single discount factor. However, in its post-hearing brief, GTE states that it would be more accurate to utilize discount rates for groups of services. GTE Brief at 82.

359. Commission Staff also utilizes an aggregate discount rate. In her testimony, Ms. Strain indicates that in order to establish service specific discounts, a company should be required to prove that the variances are caused by differences in service specific, direct avoidable costs. She indicates that such issues should be part of the pricing phase of this proceeding. Commission Staff Brief at 44-45.

360. Public Counsel also considers product specific discounts to be acceptable. However, he does not believe that the industry has reached the necessary level of sophistication to identify small differences in discount rates. Instead, he sees the current issue to be the ability to determine whether certain costs are avoidable. Public Counsel Brief at 36.

361. Sprint proposes that the only exception to the aggregate discount is for OS/DA. Sprint Brief at 70.

362. AT&T/MCI object to the use of disaggregated discounts. They claim that no publicly available information allows the distinction of these separate discounts. They also contend that the use of separate discounts may require formal filings for new disaggregated discounts whenever new products are created, which would cause delays for resellers. They believe that proceedings to determine the appropriate discount would hinder Congress' goal of expediting local competition through the resale option. AT&T/MCI Brief at 72.

363. We agree with AT&T/MCI. The use of information not in the public domain to allocate costs between various product lines introduces uncertainty and creates unnecessary complications in a process that is intended to provide the opportunity for expedited competitive entry. The Commission orders that, excluding the OS/DA and nonrecurring charge categories discussed earlier, only one aggregate discount shall be calculated.

#### **E. Components of Avoided Costs**

364. All parties seem to use the same breakdown of avoided costs, namely direct costs, indirect costs allocated in some fashion based upon direct costs, and uncollectible expenses.



## 1. Direct Avoided Costs

365. Most of the parties in this proceeding utilize a similar list of directly avoidable costs. These include customer service, product management, sales expenses, and product advertising. However, even though the parties agree that some part of these accounts should be treated as avoidable, they vary greatly in their determination of the exact portion that should be considered avoidable. In addition to the above list of accounts, AT&T/MCI, Public Counsel, and Commission Staff claim that other accounts also contain avoidable direct costs.

366. Moreover, several parties label uncollectibles as a direct cost avoidance, while others include it as an indirect avoidance; for the most part, though, uncollectibles are treated as independent of the other costs. We will discuss uncollectibles, *infra*, at paragraph 397.

### a. Customer Service, Product Management, Sales, and Product Advertising

367. Each of the parties proposes different treatment for each of these accounts. They range from AT&T's assumption that 100% of these are avoidable, to the analyses of Commission Staff, U S WEST, and GTE which indicate different levels for different accounts based upon company specific data. AT&T/MCI Brief at 75; Commission Staff Brief at 49; U S WEST Brief at 80; GTE Brief at 85.

368. AT&T argues that these costs will be incurred by the reseller, who should not bear their own costs and those of the ILECs. AT&T Brief at 75.

369. U S WEST and GTE, on the other hand, contend that the ILECs will continue to incur some of these expenses. For example, they state that service ordering activities will not be avoided altogether. U S WEST also points out that some of the costs treated as avoided by AT&T are related to products that will not be available for resale. U S WEST Brief at 80; GTE Brief at 85.

370. We disagree with AT&T's supposition that all of the costs in these accounts are avoidable in a wholesale market.

371. As discussed earlier, the Commission finds it appropriate to use company specific, including proprietary, information as a means of developing the proper level of avoided costs. Also, to be consistent with our discussion above on the separation of the discount rate for nonrecurring charges, we find appropriate U S WEST's treatment of customer service expense. The Commission concurs that costs related to services not available for resale should be excluded from the avoided cost calculation. Based upon

these factors, the Commission finds that the avoided cost determinations for each of the four accounts, as presented by Commission Staff, with the exception of the nonrecurring costs discussed above, at paragraph 356, are appropriate.<sup>40</sup> Exhs. C-148 and C-149.

### **b. Number Service and Call Completion**

372. U S WEST and GTE contend that, for the most part, these expenses are related to directory assistance and operator services, and as such should not be treated as avoidable. To the extent these costs are not related to operator services or directory assistance, they are not avoidable. U S WEST Brief at 81-82; GTE Brief at 88-89.

373. AT&T/MCI claim they want to provide their own operator services including directory assistance and, thus, these costs should be treated as 100% avoided. AT&T/MCI Brief at 72.

374. Public Counsel argues for two separate discounts, one for resellers who choose not to provide OS/DA on their own, and one for resellers who provide their own OS/DA. In the case of resellers who would not self-provide OS/DA services, Public Counsel would not treat these accounts as avoidable. In the second scenario, resellers who provide their own OS/DA, Public Counsel proposes to treat that portion of call completion which is not recovered through OS/DA charges as avoidable. Public Counsel Brief at 36.

375. Commission Staff recommends that OS/DA services have a separate discount. For the general wholesale discount, Staff proposes that call competition costs not covered by OS/DA charges should be treated as avoidable. This Staff adjustment was applied only to U S WEST, since Commission Staff is of the opinion that GTE's OS/DA revenues cover costs. Exh. 147 at 7-8.

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<sup>40</sup> Staff proposes the following values:

<i>Account</i>	<i>U S WEST</i>	<i>GTE</i>
Product Management	43.28%	28.7%
Sales	100%	71.62%
Product Advertising	100%	98.29%
Customer Service	71.92%	51.15%

376. This issue is discussed, *supra*, at paragraph 349 of this Order. The Commission will not include OS/DA charges as part of the general discount, and none of the call completion or number service account costs will be treated as avoided for this purpose. The determination of the discount rate for OS/DA charges is a separate issue that will be addressed in future proceedings.

### **c. Testing and Plant Administration**

377. AT&T argues that the FCC requires the ILECs to establish electronic interfaces. This would allow the reseller to perform certain ordering and provisioning functions for its customers without relying on the ILEC. Based upon a study of its own costs, AT&T states that it conservatively estimates the avoided testing costs at 20%. Exh. 167 at 16.

378. U S WEST contends that it will not be able to avoid any of these costs, as it would be obligated to provide these services. The Company states that AT&T and other carriers have insisted upon the same level of service that U S WEST provides its own end-use customers. GTE joins in the arguments of U S WEST. U S WEST Brief at 83; GTE Brief at 91.

379. The Commission agrees with U S WEST and GTE. First, there is no evidence of record concerning costs that would be avoided by the incumbent. While AT&T witness Dodds testifies to a study done using AT&T's costs, and the costs related to its customers, this study is not applicable to U S WEST. Second, U S WEST point out, the ILEC is obligated to provide the service, even though the reseller may chose to provide some of the service on its own.

### **d. Costs Related to Wholesale Products**

380. As discussed earlier, the Commission believes that wholesale revenues, including access revenues, should be excluded from the study. Furthermore, the costs allocated to such revenues should not be treated as avoided for the purpose of these studies. See, ¶¶324, 333, *supra*.

## **2. Calculation of Indirect Avoided Costs**

381. All parties, except Sprint, agree that indirect costs should be treated as part of the total avoided costs. The FCC found that indirect costs are assumed to be avoided in proportion to the avoided direct costs. Sprint Brief at 78-79.

382. The Commission concurs with the FCC's determination that for purposes of calculating the wholesale discount, it is reasonable to assume that indirect expenses will be avoided in proportion to the avoided direct expenses.

383. While the parties agree on the inclusion of indirect costs, they disagree about the level of indirect costs. Factors that impact the level of indirect avoided costs include: the direct avoidable cost calculation; the formula used to determine the ratio of indirect costs; and the inclusion of capital costs in the formula.

### **3. Direct Avoided Cost Calculation**

384. We have already discussed this portion of the formula and will not repeat that discussion here. See, ¶¶ 365-380, *supra*.

### **4. Formula for Determining the Ratio of Avoidable Indirect Costs**

385. Each of the parties, except Sprint, uses a ratio of avoidable direct cost to a denominator to determine the ratio of indirect avoidable costs. The parties differ on their choice of the denominator. GTE proposes to utilize total operating expense as the denominator, claiming this is consistent with the method used by the FCC. GTE Brief at 91-92.

386. No other party contests the proposition that the FCC utilizes the model advocated by GTE. However, parties have noted an inconsistency in the calculation used by the FCC and the language of its order, which states that indirect expenses are “presumed to be avoided in proportion to the avoided direct expenses.” Public Counsel Brief at 44.

387. Sprint contends that indirect expense will not be affected by the shift to wholesale expense. As such, Sprint proposes that no indirect cost should be treated as avoided. Sprint Brief at 78-79.

388. All other parties utilize direct expenses or costs in their denominators. Public Counsel believes that GTE’s approach, which uses total operating expense in the denominator, would result in a smaller portion of indirect cost being treated as avoided than if direct costs appeared in the denominator. Public Counsel points out that while there are inconsistencies in the FCC order, this Commission should decide which method is the most appropriate. Public Counsel Brief at 44.

389. AT&T/MCI and Commission Staff concur that GTE’s method is inappropriate and would understate the avoidable costs. AT&T/MCI at 76-77; Commission Staff at 44.

### **5. Capital Costs**

390. U S WEST proposes that the calculation of avoided costs be based upon total costs, not just expenses. The Company argues that capital costs, which include return and federal income taxes, are part of the total revenue requirement and, therefore, should be included in the calculation. The indirect costs portion of the operation are incurred to deal with capital investment as well as current operating expense functions. Public Counsel also utilizes the total cost approach. U S WEST Brief at 84; Exh. 152 at 13-14.

391. AT&T also attempts to measure avoidable capital costs. However, their calculation of the indirect ratio does not include capital costs. AT&T's model treats a certain portion of the net investment as avoidable indirect costs. This level is based upon the degree of avoidable direct expenses in proportion to total direct expenses. Exh. 169, JSD 1-4.

392. Commission Staff does not include capital costs in their calculation.

393. The Commission finds that it is appropriate to include indirect costs in the calculation of total avoided cost. As noted by the FCC, "[e]xpenses recorded in these accounts are tied to the overall level of operations in which an incumbent LEC engages. Because the advent of wholesale operations will reduce the overall level of operations . . . overhead and support expenses are in part avoided." The Commission agrees with the FCC's statement that indirect costs should be assumed to be avoided in proportion to direct costs. FCC Interconnection Order at ¶918. In order to achieve this proportionality, the Commission concurs with Public Counsel and U S WEST that avoided direct costs should be divided by total direct costs in order to determine this ratio. We reject GTE's position because it leads to an understatement of the indirect costs that are avoidable in a wholesale environment.

394. With respect to the issue whether to include capital costs in the calculation, we note that the inclusion or exclusion of capital costs has offsetting effects. Generally, direct capital costs have a lesser amount of their total costs avoidable than do direct expenses. Therefore, inclusion of direct capital costs in the calculation would decrease the ratio of direct avoided costs to total direct costs which is applied to indirect costs. On the other hand, there are substantial indirect capital costs, and including these costs in the calculation increases the avoided indirect costs. Regardless of the impact, the more important issue is whether inclusion of capital costs raises our confidence in the estimation of the avoided cost factor.

395. U S WEST properly indicates that the revenue requirement is made up of operating and capital costs. U S WEST Brief at 84. Unfortunately, little else is said about this matter by the other parties. The Commission finds nothing in the evidence of record which persuades us not to include capital costs. Moreover, a review of that record informs us that Public Counsel and U S WEST have very similar levels of direct and indirect capital costs. Exh. 152; Exh. 198. Hence, the Commission adopts the use

of capital costs that recognize the rate-of-return and capital structure for GTE and U S WEST that have been authorized by the Commission.

## **6. Avoided Uncollectible Expense**

396. Uncollectibles are discussed by the parties as either direct costs or indirect costs, an unimportant distinction as uncollectibles are not used to determine the portion of indirect costs that should be treated as avoided. Generally, uncollectibles are treated independently from the other costs, whether direct or indirect.

397. U S WEST and GTE state that the change from a retail to a wholesale environment would not eliminate uncollectibles. Both companies estimate the portion of uncollectibles they believe will remain in a wholesale environment. The remainder of their uncollectibles are considered to be avoidable. U S WEST Brief at 80; GTE Brief at 86.

398. Commission Staff accepts the determination of uncollectibles identified by GTE and U S WEST. Exh. C-148; Exh. C-149.

399. Public Counsel terms AT&T's estimation of uncollectibles as 100% avoidable as unreasonable, identifying situations in which wholesale customer accounts have been uncollectible. Public Counsel believes that no one has enough experience to analyze this subject at this time, preferring instead to use the FCC's method of using an indirect ratio for measuring the level of avoidable uncollectible expense. Public Counsel Brief at 38.

400. AT&T argues that only a reseller will have uncollectibles associated with the retail customer. They also claim the ILECs will not experience uncollectibles associated with sales to AT&T. AT&T Brief at 76.

401. We do not agree with AT&T. Wholesale customers have generated in uncollectible revenues for ILECs; to assume that resellers will not create bad debts for the ILECs is unreasonable. We agree with the ILECs' approach to measuring the level of bad debts of wholesale customers versus retail customers, and treat the difference as avoided cost.

## **7. Discount Rate Calculation Denominator**

402. After total avoided costs are determined, a denominator must be established in order to calculate the discount rate for avoided costs. Much of the previous discussion will inform our determination of the denominator. We use intrastate data, which excludes OS/DA and nonrecurring charges and costs. We also exclude Intrastate wholesale activities, such as access charges. The Commission also accepts the removal of other miscellaneous items included in Commission Staff's calculation of "intrastate retail." Exh. 147 at 3; Exhs. C-148 and 149. Finally, it left for us to determine whether the total affected revenues subject to resale or total costs should be used as the denominator.

403. U S WEST contends that the use of revenues is only a proxy method and is ill-suited to product specific discounts. Further, that the use of total costs would eliminate several issues, such as allocations and subsidies, which are raised by using revenues. The Company claims that the only accurate use of revenues is when total costs for a group of products is exactly equal to the revenues for the same products. U S WEST argues strongly against MCI's original proposition that only operating expenses appear in the denominator, contending that use of expenses, which are only a subset of total costs, unfairly increases the discount rate. U S WEST Brief at 71.

404. Sprint, GTE, Commission Staff, Public Counsel, and AT&T/MCI all support the use of revenues in the denominator. Commission Staff states that the discrepancy between costs and revenues is substantial. Staff believes the avoided cost study should not be used to cure any rate deficiency the ILECs may be incurring. AT&T/MCI indicate that the Act requires the discount rate to be the retail rate, less avoided costs. Thus, the use of costs would distort the discount rate causing it to be either too high or too low, depending upon whether costs were greater or less than revenues. Public Counsel endorses the positions advocated by Commission Staff and AT&T. Commission Staff Brief at 39-42; AT&T/MCI Brief at 70-71; Public Counsel Brief at 32-33.

405. The Commission adopts the recommendation of Commission Staff regarding the use of revenues in the denominator. U S WEST's position that total costs should be used has some appeal, in that the current rates may represent regulatory lag. Further, we think U S WEST may be correct that, on a theoretical basis, revenues should ultimately be set to equal total costs. However, this assumes that the costs included in the study are the basis for setting rates. As Commission Staff points out, the revenues and the total costs in the U S WEST study are not equal -- the costs greatly exceed the revenues on both a total intrastate basis and a retail intrastate basis. There is no indication that the costs included in U S WEST's avoided cost study are consistent with the methods for determining costs which we established in the Company's 1995 general rate increase case. For example, it is not clear if U S WEST has yet made the appropriate adjustment for *Yellow Pages*. However, the data indicates clearly that the revenue deficiency in U S WEST's study is substantial. Exh. 197; Exh. 198. Compare that reported revenue deficiency with U S WEST's two recent

general rate increase proceedings, which used test periods just prior and just subsequent to the test period for its avoided cost study in this proceeding, where the Commission's Orders resulted in a net decrease in the Company's Washington intrastate revenue requirement. Furthermore, the Commission agrees with AT&T that the Act requires that the discount rate be the retail rate, less avoided costs.

#### **F. Summary of Avoided Costs Analysis**

406. The Commission findings on avoided costs from the preceding paragraphs are summarized as follows. All retail telecommunications services, including discounted products and deregulated services, are subject to resale. This does not include enhanced services or wholesale services. Embedded costs should be utilized in avoided cost studies. The data relied upon should be separated, intrastate data. The use of proprietary information should be held to a minimum and should only be used when to do otherwise would produce an unreasonable result.

407. OS/DA services and nonrecurring charges are retail products that are subject to resale. The Commission finds it appropriate to establish separate discounts for each of these services, and orders GTE and U S WEST to file studies of these services consistent with this order. With respect to all other intrastate retail services, only one wholesale discount rate is determined. The nonrecurring costs in excess of the nonrecurring revenues will be treated as direct, 100% avoidable costs for all other services.

408. The Commission's review of direct, avoidable costs indicates that Commission Staff's estimates of the ratio of avoidable costs for product management, sales, and product advertising are appropriate. With respect to customer services, the Commission also finds Commission Staff's ratio to be reasonable, except that the customer service costs related to nonrecurring charges in excess of revenue are 100% avoidable. The Commission finds it unnecessary to treat a portion of U S WEST's directory assistance cost in the call completion account as direct avoidable costs. Otherwise, we adopt Commission Staff's presentation on call completion and number service. Finally, the Commission does not find any testing or plant administration cost to be avoidable.

409. The Commission agrees with the FCC's determination that indirect costs should be treated as avoidable in proportion to the avoidable portion of direct costs. To determine this portion of avoided costs, the Commission believes that total direct avoided costs should be divided by total direct costs, which includes capital costs. This ratio should be applied to all indirect costs, including capital costs, in order to determine the amount of indirect avoided costs. The recommendations of U S WEST and GTE concerning uncollectibles is appropriate.

410. To establish the wholesale discount rate, direct and indirect costs and uncollectibles should be divided by revenues. Applying the above findings, the



Commission calculates a wholesale discount rate for U S WEST of 14.69% (see *Proprietary Appendix A* to this Order<sup>41</sup>). This calculation is based upon the capital costs in Commission Staff's study. It assumes that these capital costs are consistent with our finding that the latest authorized capital structure and rate-of-return should be utilized. If this assumption is wrong, this rate would have to be modified. The Commission is unable to calculate GTE's general wholesale discount rate in a manner consistent with these findings, and, thus, orders GTE to submit a cost study consistent with the letter and spirit of our findings in this section of the Order no later than ten days after the date of this Order.

## IX. COLLOCATION

411. The evidence of record contains little discussion of the collocation studies submitted by the ILECs. TCG/NextLink Brief at 28; GTE Brief at 97-98.

412. The FCC has issued an order following review of the rates, terms, and conditions for physical collocation contained in tariffs that ILECs were required to file prior to passage of the Act. *In re Local Exchange Carriers' Rates, Terms, and Conditions for Expanded Interconnection Through Physical Collocation for Special Access and Switched Transport, Second Report and Order*, CC Docket 93-162 (June 13, 1997) (Physical Collocation Order). The FCC ordered that certain revisions must be made to the ILECs collocation studies.

413. During evidentiary hearings in this proceeding, U S WEST witness Reynolds indicated that while he was aware of the Physical Collocation Order, he had not evaluated how the FCC's conclusions would impact the studies submitted in this proceeding. Tr. 1844-85.

414. GTE's cost witness was not cross-examined about the extent to which its studies were consistent with the FCC's findings in the Physical Collocation Order. The Physical Collection Order applies to GTE, as it does to U S WEST.

415. TCG/NextLink notes that U S WEST has raised the possibility that it would allow CLECs to self-provision some facilities. If self-provisioning was available to

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<sup>41</sup> The calculation supporting the determination of U S WEST's general wholesale discount includes data designated confidential by the Company. The Appendix is available only to parties to this proceeding who have executed the requisite confidentiality agreement.

CLECs, the availability of an alternative supplier would constrain the ability of the ILECs to charge unreasonable prices. TCG/NextLink proposes that the Commission establish a separate proceeding to consider self-provisioning and to allow a more complete evaluation of the collocation cost studies. TCG/NextLink Brief at 29-31.

416. We will not establish a separate proceeding to reconsider collocation costing issues at this time. TCG/NextLink had the opportunity in this case to evaluate the ILECs' cost studies. Their decision not to introduce more extensive evidence on the reasonableness of the studies is not grounds for opening a new proceeding.

417. On the other hand, we do believe there is merit in evaluating the degree to which the cost studies submitted in this proceeding comply with the findings of the FCC's Physical Collocation Order. Therefore, we will require GTE and U S WEST to submit testimony in Phase II of this proceeding regarding the degree to which their studies comply and are consistent with the Physical Collocation Order (including, but not limited to, U S WEST's EICT recurring cost study). To the extent that the studies are not consistent, we will require GTE and U S WEST to modify the studies to be in compliance with the FCC's Order. In their testimony on the collocation studies, the ILECs are free to address the reasonableness of the modifications that may be required pursuant to the FCC's Order.

418. The other parties will have the opportunity to file responsive testimony on the ILECs' submissions.

419. TCG/NextLink proposes that the Commission require U S WEST and GTE to self-provision collocation facilities and/or to solicit bids from outside contractors for site preparation work that the ILECs can either match or allow the contractor to perform. TCG/NextLink Brief at 31. We believe that this is a pricing issue that the parties should address during Phase II of this proceeding.

## **X. LOCAL NUMBER PORTABILITY**

420. Local number portability, or service provider number portability (SPNP), refers to the arrangements provided to a CLEC that permits local exchange customers to change service providers and retain their existing telephone numbers.

421. In this proceeding, only "interim" local number portability is at issue. WITA Brief at 27.

422. Public Counsel argues that U S WEST's cost study is flawed. U S WEST reports that the cost of providing interim number portability to CLECs is greater than the

cost to provide the service to retail customers. According to Public Counsel, one reason that U S WEST's claimed cost for remote call forwarding (the interim provisioning of number portability) when provided to a CLEC is so high is because the Company assumes that the majority of the customers who would be using number portability would be business "PBX" lines. Since PBX usage is higher than that of a typical customer, this raises the estimated cost of providing interim number portability. Public Counsel Brief at 48-49.

423. U S WEST's cost study indicates that the Company's usage forecast presumes that no residential customers will be served by the CLECs. Exh. C-115, Service Provider Number Portability, October 1996, Executive Summary, at 2.

424. It is not possible to determine if GTE made a similar assumption because its documentation, relative to that supplied by U S WEST, is inadequate. See, for example, Bates Stamp 000615, 00617, 001028-001053.

425. Based upon the prescribed depreciation rates, U S WEST found that the monthly TELRIC for interim local number portability is \$5.80 if transport is required, and \$3.77 without transport. The cost estimate includes the recovery of non-traffic sensitive costs. Exh. C-115, Service Provider Number Portability, October 1996, Executive Summary at 8, and Cost Summary at 5.

426. We do not accept U S WEST's study for three reasons. First, as argued by Public Counsel, the assumption that remote call forwarding will be used largely by high-usage business customers is inconsistent with the customer mix they assumed when calculating the unbundled loop cost. For the unbundled loop cost, the mix of customers used was the existing loops in service, excluding Centrex lines. Exh. 152 at 51. Second, for a clearly traffic-related function, we are skeptical of the finding that a portion of the reported costs are non-traffic sensitive.<sup>42</sup> And, finally, the results are simply unreasonable. As pointed out by Public Counsel, the wholesale rate for remote call forwarding is a multiple of the Company's estimate of the cost of providing remote call forwarding to end users. Public Counsel Brief at 47.

427. U S WEST apparently disputes this point, by claiming that its retail rate for remote call forwarding is greater than the cost estimate for interim number portability: "As a point of validation, these retail charges establish the reasonableness of the [interim number portability cost estimate]." U S WEST Brief at 97.

428. Most of U S WEST's proposed UNE NRC charges fail the validation test it

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<sup>42</sup> U S WEST states that it includes non-traffic sensitive costs due to the design of the Lucent switch. The documentation makes no mention of the Nortel switches. Furthermore, we are skeptical that the technological limitation described by U S WEST cannot be circumvented through a modification to the software code. Exh. C-115, Service Provider Number Portability, October 1996, at 3.

proposes for interim local number portability. Indeed, earlier in its post-hearing brief, U S WEST stated that retail NRCs are not appropriate proxies for UNE NRCs. *Id.* at 93. We find it paradoxical that U S WEST rationalizes the reasonableness of its interim local number portability cost estimate by making reference to its retail rate, while simultaneously arguing against a similar test elsewhere.

429. Furthermore, the issue raised by Public Counsel is not the relationship between the cost estimate for interim local number portability and the retail rate. Rather, Public Counsel points out that the cost estimate for interim local number portability greatly exceeds the cost estimate for the comparable retail service. There is no explanation by U S WEST for this anomaly.

430. Neither do we accept GTE's cost study for interim local number portability. The documentation of this study is inadequate; therefore, it is not possible to evaluate how the cost estimates were derived.

431. Furthermore, as with the U S WEST cost study, the GTE study exhibits the same peculiar relationship between the estimated cost of retail service and interim local number portability. The estimated cost of interim local number portability is a multiple of the cost identified for the retail remote call forwarding service. Exh. 65, WATELRIC.WK4, folder UNE Sum, and folder MiscFeatSum, line 26. Further, it appears that GTE has included the cost of calls that go into and out of its central office. Exh. 65, WATELRIC.WK4, folder INP. This assumption appears to be inconsistent with the methodology used to estimate the cost of the retail remote call forwarding service. Exh. 65, WATELRIC.WK4, folder MiscFeatSum, lines 53, 62-67.

432. The Hatfield Model assumes that the cost of providing interim local number portability is \$0.25 per month. BCPM does not provide a cost estimate for this function.

433. AT&T says that the Commission should handle interim local number portability on a bill-and-keep basis or on relative market share. AT&T Brief at 86.

434. TCG/NextLink expresses their concern that the ILECs' cost studies allocate the entire cost of interim local number portability to the CLECs. They state that this procedure violates the standards established by the FCC in its local number portability decision. TCG/NextLink Brief at 32.

435. In Phase I, parties have provided their estimates of the cost of providing interim local number portability. The method used to recover these costs is a pricing issue, not a costing matter, which the parties can address in Phase II. Therefore, the proposal made by AT&T/MCI and TCG/NextLink is more properly considered in Phase II of this proceeding.

436. We will use \$1.50 as the cost of providing interim number portability. This

cost is based upon our consideration of the different cost estimates provided for interim number portability by the ILECs and by the Hatfield Model, as well as the cost of providing retail remote call forwarding.

## **XI. INTERCONNECTION/TRANSPORT AND TERMINATION**

437. AT&T urges the Commission to maintain our prior finding in the Interconnection cases that bill-and-keep should be used for transport and termination. If the Commission decides to change its policy, AT&T recommends that the Hatfield Model be used to estimate the cost of common, dedicated, and direct transport. AT&T Brief at 87-8.

438. TCG/NextLink concurs that bill-and-keep should be maintained for the pricing of transport. TCG/NextLink Brief at 34.

439. U S WEST has submitted a cost study for transport. In its post-hearing brief, it does not concur with the other parties' advocacy for maintaining bill-and-keep compensation for transport. U S WEST Brief at 97-98.

440. GTE raises a number of objections to the Hatfield Model's calculation of inter-office facilities, including the model's effective route-to-air mile ratio. Exh. 53 at 23-27. AT&T/MCI do not address GTE's criticisms regarding the Hatfield Model's route-to-air mile ratios. Due to our concern regarding the calculation of this value in the model, we do not believe that the Hatfield Model should be used to calculate inter-office costs.

441. AT&T/MCI witness Zepp criticizes three of the inputs to the U S WEST Transport Model. Exh. 162 at 39-40. Mr. Zepp claims that the fill rate in the study is too low, but he offers no testimony regarding the fill levels incurred by an efficient firm. He then asserts that the modeling of rings does not sufficiently reflect forward-looking technology, and, finally, that route-to-air miles are not correctly calculated. With regard to these last two criticisms, we find that his points are not sufficiently developed in the record.

442. No party critiqued the GTE transport study.

443. Currently, transport compensation is handled through a bill-and-keep procedure. Under the bill-and-keep arrangement, there is no need to quantify the cost of transport. In Phase II of this proceeding, the parties may propose alternative compensation methods. If we adopt an alternative method in Phase II, at that time we will require GTE and U S WEST to modify, and to re-submit for verification, their studies to reflect the cost of money and depreciation lives we adopt in this Order. If we adopt bill-and-keep compensation, there will be no need to re-do the studies.

## **XII. NONRECURRING COSTS**

444. Nonrecurring costs historically are classified as costs incurred in initially establishing service for an individual customer. They are transaction related. Costs incurred to set up a customer's service typically include customer service expenses and, depending on the service, the cost of physically connecting a customer to the network. Commission Staff notes that today, in some cases, the establishment of service can be accomplished from a computer work station, without physical rearrangement of the facilities necessary to serve the customer. Nonrecurring costs are typically recovered, at least primarily, through nonrecurring charges, which the customer pays at the time that service is initiated. Commission Staff Brief at 51.

445. AT&T/MCI contend that the Hatfield Model reflects both recurring and nonrecurring expenses through the inclusion of annual charge factors developed from publicly available 1995 ARMIS data. Hence, they assert that the non-recurring costs are already recovered through their proposed recurring rates. AT&T/MCI Brief at 80-81.

446. GTE and U S WEST disagree. They point out that the 1995 ARMIS data do not cover the cost of providing UNEs and, therefore, this cost is not included in the Hatfield Model's study. GTE Brief at 94; U S WEST Brief at 86.

447. Commission Staff notes that, even if transaction costs are captured by the Hatfield Model, these costs should not be included in the cost estimates of unbundled network elements. Instead, nonrecurring costs should be explicitly identified in a separate study. Commission Staff Brief at 54.

448. We concur with U S WEST and GTE that the Hatfield Model does not adequately estimate nonrecurring costs, because the costs were not part of the ILECs' cost structure in 1995. Furthermore, even if they were, the Hatfield Model's methodology is inappropriate. The model estimates expenses by multiplying the current investment by the historical relationship between expenses and investment. Whereas the model estimates that the current investment in a network is less than the embedded investment, it effectively predicts a reduction in maintenance expenses. While cost reductions are likely to occur, the sponsors have not made a compelling argument that the model accurately estimates the forward-looking maintenance costs.

449. The attractive part of the method used by the Hatfield Model for estimating nonrecurring costs is that the study relies on data that are in the public domain. Since the data are flawed, we believe that there is a need to substitute other information for the ARMIS data.

450. The RBOC studies do not use data that are in the public domain. Rather, U S WEST and GTE provide time estimates from their subject matter experts.

451. The Commission is concerned that these time estimates may be biased upward. As the ILECs are the sole providers unbundled network elements, we are

concerned that their estimated costs may be too high. We asked the parties to address our concern. Specifically, we posed this question to the parties: "Can the ILECs' NRC studies be validated?"

452. Throughout this proceeding, GTE repeatedly has emphasized the need to validate the reasonableness of expert opinion. On page four of its post-hearing brief, GTE states:

This Commission should recognize -- and apply -- the legal standards relevant to the admission of expert testimony. The Hatfield Model at issue in this proceeding is based upon a set of theoretical and hypothetical assumptions, often supported by the opinion of the sponsors -- and little else. In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S.Ct. 2786 (1993), the U.S. Supreme Court focused on the methodology used by experts to arrive at their conclusions, and emphasized the responsibility of the courts to insure that the proffered evidence is valid and has been tested. *Id.* at 2796. Expert opinions which have not been validated should not be considered. This Commission is duty bound to determine whether the proponent of the particular cost model has carried its burden of demonstrating that the underlying methodology has been validated. *Id.* at 2795. See Berger, "Evidentiary Framework," *Federal Judicial Center Manual on Scientific Evidence* (1994).

[I]f an opinion is fundamentally unsupported, then it offers no expert assistance to the jury; and the lack of reliable support can render an opinion substantially more prejudicial than probative, making it inadmissible under Rule 403.

*Christophersen v. Allied-Signal Corp.*, 939 F.2d 1106, 1120 (5th Cir. 1991) *en banc*, *cert. denied*, 112 S. Ct. 1280 (1992). See also, *Richardson v. Richardson-Merrell, Inc.*, 823 F.2d 829 (D.C. Cir. 1988).

453. In response to the Commission's question as to how the opinion of GTE's experts could be validated, the Company offers us no testimony. Instead, GTE postulates that ***its opinion is valid*** "because it is based on the actual GTE-specific costs that arise from the system that is in place today to process a CLEC's LSRs [local service requests]." GTE Brief at 95.

454. U S WEST, in response to the same question, suggests that validation of the nonrecurring cost numbers may not be possible. U S WEST Brief at 90.

455. U S WEST adds:

[T]here may be a temptation to validate the NRC studies for elements against the existing NRCs for services. This may be possible, but should be done with caution, recognizing the difference between elements and services, and understanding that the parallels may only be rough. One example of this is the parallel between unbundled loops and private lines. U S WEST has explained that provisioning a loop is more like provisioning a private line, with similar nonrecurring activities. The nonrecurring retail rates associated with private line service are higher than those calculated for unbundled loops. To the extent that these nonrecurring charges can be used to validate the non-recurring costs, they do so and establish that U S WEST's nonrecurring costs for UNEs are reasonable.

*Id.*

456. The Commission is satisfied that we have met GTE's proposed standard, because of our active participation in the evidentiary hearings in this proceeding. The transcript reflects pertinent and substantial cross-examination by the bench of virtually every subject matter expert who appeared in support of the cost models sponsored by the parties. The bench challenged these experts on their qualitative methodological approach to modeling, and on the quantitative assumptions, inputs, and values posited by these witnesses. We are confident that the findings we make in this Order are supported by the evidence of record and are informed by our questions of these witnesses. We found the developers of the Hatfield Model to be especially open in their dialogue with the bench in that they were both direct and comprehensive in their responses; the developers of the BCPM [model] also were forthcoming in their responses to our questions. We also acknowledge that some expert witnesses presented by other parties were of assistance to us in understanding their positions.

457. U S WEST argues that the provisioning of an unbundled loop is more like provisioning a private line than an ordinary voice line. U S WEST Brief at 90-93. Unbundled loops, unlike the loop used for retail voice service, do not connect to the ILEC's switch. U S WEST points out that the unbundled loop "requires a meet point to a CLEC's collocated equipment, and, as such, end points of the circuit must be identified. This requires use of the "common facility arrangement capabilities" associated with private line services. Exh. 117 at 62.

458. Commission Staff, AT&T/MCI, and TCG/NextLink dispute that an unbundled loop is similar to a private line loop. Commission Staff Brief at 53;



TCG/NextLink Brief at 27; Exh. 157.

459. TCG/NextLink points out that some ILEC's cost estimates are discriminatory because wholesale rates would likely exceed the retail rate. TCG/NextLink Brief at 25-26.

460. We disagree with the suggestion that the retail nonrecurring charge associated with a private line loop could be used as the basis for comparison with the proposed nonrecurring cost for an unbundled loop. The unbundled loop may connect to the CLEC's collocated equipment, rather than the ILEC's switch, because the ILEC may not want to provide the CLECs with the bundled loops and switch network elements it requests. The bundling of the loop and port is an issue in dispute between the CLECs and the ILECs, though the Commission is of the opinion that the ILECs are obligated to provide bundled network elements. Pending ultimate resolution of this legal issue, we will address in this proceeding how to cost the unbundling of bundled network elements.

461. Should our view that the ILECs are required to offer bundling of the loop and port be rejected, we believe that in the pricing phase of this case, the parties should address how the cost of separating the loop and the switch should be recovered. One of the objectives of the Act is to promote the development of efficient competition. There is a body of economic literature which suggests that efficiency losses can occur when a dominant incumbent firm raises the cost of its rivals.<sup>43</sup> We order the parties to address the appropriateness of having new entrants pay for costs that are due to potential network inefficiencies associated with unbundling the port and the switch. Specifically, the parties must address the question whether the cost causer for the connection to the collocation cage is the CLEC, because it is ordering the network element(s), or is it the ILEC, because it will not on its own bundle the network elements?

462. Of course there are instances when a CLEC, even if it could order a bundled loop and port, would obtain only the loop. In this circumstance, we find the costs identified by U S WEST to be unreasonable. The Company's "unbundled loop nonrecurring study does not reflect any new mechanization of the ordering process at this time." Exh. 117 at 63.

463. We believe that this is an unreasonable starting point. U S WEST witness Reynolds testified that, as an outgrowth of discussions with AT&T, U S WEST talked to its vendors and identified a less expensive way of grooming loops that are destined for the CLEC collocation cage. This alternative process significantly reduced the recurring cost of grooming. Tr. 1925-26. We believe that, if a similar effort is made to identify potential cost savings for nonrecurring activities, other efficiency gains can be identified.

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<sup>43</sup> See, for example, S. Salop, and D. Scheffman, (1983), "Raising Rivals' Costs, American Economic Review - Papers and Proceedings, 267-271.

464. Our conclusion is based, in part, on U S WEST's reliance on cost data estimates that were developed in the late-1980s and early-1990s. Tr. 2090-91. We believe that it is more than likely that there have been major efficiency gains in the ensuing years and we are not convinced that they are reflected in the U S WEST study.

465. Neither do we accept U S WEST's assertion that the cost of connecting an unbundled loop is similar to the cost of a private line. Private line circuits are often used for high-speed data services and, therefore, their engineering requirements are significantly different than those loops that are used for ordinary voice communications. See, for example, Exh. 48, "Digital Special Access Lines." Some slower speed private line services might require special balancing that is not required for an ordinary voice circuit.

466. U S WEST states in its post-hearing brief that its time estimates are reasonable and have been "revised and updated as necessary." It adds that "U S WEST recently modified the time estimates in one of these studies to reflect a six minute requirement as opposed to the previous 45 minutes." U S WEST Brief at 92, citing Tr. 2068.

467. The transcript shows that U S WEST claimed that it had updated its Local Interconnection Service (LIS) Link Study in December 1997. The Company's cost witness, Ms. Santos-Rach, stated that the revised study reflected six minutes of work at the interconnection service center.<sup>44</sup> The prior study indicated 45 minutes of work effort. Tr. 1987-88, 2068.

468. The December 1996 Study still reflects the 45 minute time period for the first link ordered. LIS-LINK 2 Wire/4 Wire Nonrecurring Cost Study, December 1996, at 1 of 32. We have modified the study to reflect the six minute time period.<sup>45</sup>

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<sup>44</sup> See U S WEST's Response to BCH 02-007 for a description of the work function performed at the interconnection service center (ISC).

<sup>45</sup> In the December 1996 study, U S WEST included only six minutes of ISC work time for additional orders. But this is six minutes more than was included for a connection in the prior study. Therefore, contrary to the suggestion of U S WEST, it is not a reduction in time. Furthermore, the use of the 45 minute period in the December 1996 study for the first link ordered is inconsistent with the testimony of U S WEST witness Santos-Rach. Tr. 1988. For both original and additional orders, the December 1996 study reports higher costs than the study filed in August 1996. Compare, Local Interconnection Service Links--1996 Nonrecurring Cost Study, August 1996, (Executive Summary at 8), at 1-6 of 19, with LIS-LINK 2 WIRE/4 WIRE 1996 Nonrecurring Cost Study, December 1996, (Executive Summary at 8), at 1-8 of 32.

469. We make two other changes to the U S WEST study. We modify the study and adopt a 15%, rather than a 45%, probability that a link order will require manual plant line assignment. We have also set the common overhead factor to zero. We believe our assessment of manual plant line assignment is more reasonable. The second change reflects our decision to address the recovery of common costs in Phase II of this proceeding. Based upon these three changes, we conclude that the nonrecurring cost of an installation is \$30.15.<sup>46</sup>

470. U S WEST's *Executive Summary* of its nonrecurring cost study states that the study identifies "the provisioning activities involved in providing a service[.]" Included in the time estimates for the work, but not explicitly stated in the narrative, is the time involved in disconnecting an unbundled network element. U S WEST LIS-LINK 2 WIRE/4 WIRE Nonrecurring Cost Study, December 1996.

471. AT&T/MCI criticizes the bundling of disconnection and connection charges. Exh. 162 at 32-34.

472. We find U S WEST's inclusion of disconnection costs to be inappropriate, because the study does not take into account the time value of money, nor the likelihood that a UNE would be disconnected. Furthermore, the time estimates associated with the disconnection are not reasonable.<sup>47</sup>

473. We have modified the disconnection study to reflect that the time at the interconnection service center will be only six minutes, and, that at the central office frame, a craftsman will only require two minutes to analyze an order and will spend three minutes removing a jumper. With these changes, as well as our decision to exclude common costs, we find the cost of disconnection to be \$11.58.

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<sup>46</sup> The calculation of this value was complicated by the fact that the electronic copy of the U S WEST NRC study excluded many links between cells.

<sup>47</sup> For example, U S WEST assumes that all UNEs will be disconnected and that the provisioning of the order at the service center will require 30 minutes of labor. LIS-LINK Nonrecurring Cost Study, at 2 of 32.

U S WEST noted that its study of disconnection costs did not take into account that labor rates would be going up over time. U S WEST proposed that the increase in labor costs "basically offset" the time value of money. Tr. 2090. We disagree for two reasons. First, the time value of money is significantly higher than the yearly percentage increase in wages. Second, while labor cost-per-hour may increase, there will likely be offsetting declines in unit costs due to the increased use of automated support systems. The U S WEST study assumes that the same methods used in the 1980s would be used today and in the future. Tr. 2090-91. We find this assumption to be unreasonable.

474. The parties did not address in-depth the other nonrecurring studies.<sup>48</sup> We will require U S WEST to modify its other nonrecurring studies in a manner consistent with our findings as fully described above. If the revised studies do not reflect both the letter and the spirit of this decision, we will make identical adjustments to the other studies according to our findings described above.<sup>49</sup>

475. AT&T/MCI object to the GTE nonrecurring cost (NRC) study because it was based upon the cost of providing retail services, and on manually processing orders. They add that, since GTE provided only summary numbers, and no model, it is not possible to replicate or validate the costs for which the Company requests compensation. AT&T/MCI focused most of their attention on U S WEST, because "GTE has filed virtually no supporting documentation." Exh. 157 at 5, 7; Exh. 163 at 8.

476. AT&T/MCI argue that GTE's failure to provide the model associated with its NRC study violates the Commission's requirement that cost studies be open and verifiable. They add that the lack of such information prevents anyone from commenting upon or validating the results. AT&T/MCI Brief at 83.

477. GTE argues that it is appropriate to assume a manual system and to use retail costs as a foundation for estimating the cost of providing service to wholesale customers. GTE Brief at 93.

478. The GTE NRC study identifies the work activity, work time, labor rate, and frequency of different functions. We have reviewed the study and find that many of the time estimates are unreasonable. We agree with AT&T/MCI that insufficient documentation and support have been provided for the study. Whereas the Company has not provided an electronic version of the study, we will require that it be filed and that it include the following modifications: First, as with U S WEST, we require GTE to file separate costs for connect and disconnect activities. Second, GTE must provide a narrative explanation of the activity associated with MARK, CBSS, and Line Screen, and its relation to other activities included in the model. Furthermore, the changes identified in the *Appendix* to this Order should also be incorporated into the study. The revised study must be filed with the Commission, and simultaneously served on all parties, no later than 30 days after the date of this Order.

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<sup>48</sup> AT&T/MCI witness Petti testified regarding concerns she has with some of the assumptions in the ILEC's NRC studies. She did not quantify, however, the impact these concerns have on the ILECs estimated costs. Exh. 156.

U S WEST indicates that it would not assess a nonrecurring charge for EICT if it was ordered at the same time that an unbundled loop is ordered. Tr. 1872.

<sup>49</sup> The total cost could be estimated by multiplying the ratio of U S WEST's estimated costs by 36% [1 - (11.58+30.15)/116.18].

479. AT&T/MCI object to U S WEST's assumption that 33% of customer transfers would require manual intervention by U S WEST. Exh. 157 at 27-28.

480. As we state above at paragraph 41, we believe that the appropriate manual intervention rate should be addressed simultaneously with our consideration of transition costs in Phase II.

481. AT&T/MCI request that the Commission require U S WEST to include in its tariff a provision that no further nonrecurring charges will be assessed once a transport facility is in place. Exh. 157 at 32-33. This is a pricing issue that can be raised by AT&T/MCI, or other parties, during Phase II of this proceeding.

482. The cost findings in this Order do not reflect the transactional efficiencies that may be achieved through computer links between the ILECs' and CLECs' operational support systems. When these systems are in operation, we expect the ILECs to fulfill their commitment to revise their studies to reflect the associated cost savings. U S WEST Brief at 91.

### **XIII. COMMISSION CONCLUSION**

483. The Act requires that the price of unbundled elements be just and reasonable. In Phase I of this proceeding, we have identified the recurring and nonrecurring cost of network elements. Consistent with the statutory requirement, our these costs have been determined without engaging in a rate case. 47 U.S.C. § 252(d)(1)(A).

484. For the most important network element, the local loop, our cost determination is based upon an extensive review of four cost models and the written and oral testimony of many expert witnesses. We have evaluated both the algorithms used to make the cost calculations and the input values for the models. In reviewing the cost model algorithms, we have once again observed the need for models to be open to public review. All of the models include formulas which merit close inspection, and this process is seriously impeded when the cloak of confidentiality is applied to the model algorithms, inputs, or outputs.

485. The parties have proposed a wide range of inputs for the cost models. Our Order reflects a careful review of all the testimony and exhibits. We believe that, through this process, we have succeeded in identifying inputs and obtaining TELRIC estimates that are consistent with the principles that were identified in the introductory section of this Order.

486. We have also established a wholesale discount rates for U S WEST, and require GTE to file an avoided cost study consistent with our Order. These are rates which will be consistent with the §251(c)(4) requirement that retail services be made available to CLECs at a discount which reflects the costs that are avoidable in a wholesale environment.

487. Having discussed above in detail both the oral and documentary evidence concerning all material matters, and having stated findings and conclusions in each numbered paragraph, the Commission now augments those findings and conclusions with the following general statements on the evidence of record. Those portions of the preceding detailed findings and conclusions pertaining to the ultimate decisions of the Commission are here incorporated by this reference.

#### **XIV. FINDINGS OF FACT**

488. The Washington Utilities and Transportation Commission is an agency of the state of Washington, vested by statute with authority to regulate rates, rules, regulations, practices, accounts, securities, and transfers of public service companies, including telecommunications companies.

489. U S WEST Communications, Inc., and GTE Northwest Incorporated are each engaged in the business of furnishing telecommunications service within the state of Washington as a public service company.

490. The purpose of Phase I of this proceeding is to establish costing procedures and cost levels for unbundled network elements, including the loop, switching (port, usage, and vertical features); interconnection; transport and termination; physical and virtual collocation; nonrecurring activities; resale of telecommunications services; and interim local number portability.

491. The costs established by this Order will serve as price floors for network elements, with certain exceptions, *e.g.*, interim local number portability, where the cost will serve as the price floor. Phase II will focus on the extent to which there should be uniform or variable "mark-ups" over the price floor for different network elements.

492. The costs established in Phase I should be premised upon open, reliable, and economically sound cost models and cost inputs which provide the opportunity to review both the compiled and uncompiled source codes; document the input values; include a narrative description of the models' operation; and permit modification and sensitivity analysis.

493. The computerized analytical models sponsored in this proceeding are economic cost models designed or used to measure the costs that would be incurred to reconstruct the network under certain specified conditions, *e.g.*, the “scorched node” assumption, and to disaggregate the otherwise undifferentiated costs of the network into various cost elements.

494. The parties sponsored models, such as those developed by Bellcore, that are largely closed and subject to restrictions on access imposed by the developer. Other models, notably the Hatfield Model and the Benchmark Cost Proxy Models, are relatively open, although both use data not in the public domain. All of the models are going through an evolutionary process at this time.

495. Incumbent local exchange companies may be entitled to some compensation for certain expenditures made to comply with the Telecommunications Act of 1996, which we label “transition costs”.

496. The Commission finds it is not appropriate to deaverage costs for unbundled network elements and interconnection in this proceeding.

497. The sponsored loop cost models can be used in Phase I of this proceeding to establish a range of reasonable costs. The Commission should make the modifications to the assumptions and inputs for the four loop cost models sponsored in this proceeding as described in *Appendix B*, attached and incorporated into this Order by this reference.

498. Based upon our findings, those costs include for U S WEST-- a monthly unbundled loop cost of \$17.00; a four-wire loop cost 25% greater than the two-wire loop cost; a monthly switch port cost of \$1.29, and a per minute of use switch cost of \$0.00115; a general wholesale discount of 14.69%; a monthly interim local number portability cost of \$1.50; a nonrecurring unbundled loop installation cost of \$30.15 and loop disconnection cost of \$11.58; an interim 50% avoided cost discount for nonrecurring activities; and, for GTE -- a monthly unbundled loop cost of \$20.00; a four-wire loop cost 25% greater than the two-wire loop cost; a monthly switch port cost of \$1.29, and a per minute of use switch cost of \$0.00136; a monthly interim local number portability cost of \$1.50; an interim 50% avoided cost discount for nonrecurring activities.

499. The Commission is unable to calculate GTE’s general wholesale discount from the model as filed.

500. A single general wholesale discount, using embedded costs and relying upon separated, intrastate data should be determined.

501. The revenue from operator service and directory assistance service should not be included in the calculation of the general wholesale discount, nor should the direct costs of these services be treated as avoided costs.

502. The revenue and costs of nonrecurring activities should not be included in the calculation of the general wholesale discount; the level of costs removed from the calculation is limited to the level of revenues removed from the calculation.

503. The Federal Communications Commission has required ILECs to file certain revisions to the companies' collocation studies.

504. The compensation for transport is currently handled through a bill-and-keep arrangement. As such, there is no need to quantify the cost of transport.

## **XV. CONCLUSIONS OF LAW**

Having articulated the legal basis for its decision in Memorandum section, the Commission makes the following conclusions of law.

505. The Washington Utilities and Transportation Commission has jurisdiction over the subject matter of these proceedings and the parties.

506. An open or transparent model is in the public interest in that it allows a full exploration of the advantages and limitations of a model and allows the public to evaluate all of the information which is used to set prices. None of the models sponsored in this proceeding fully meets the Commission's criteria for an open or transparent model.

507. The Commission should not adopt any of the models sponsored in Phase I of this proceeding. The models fail to satisfy our objectives that a model be open, reliable, and economically sound.

508. In future Commission proceedings, proxy model sponsors should be required to address the relationship between their cost study's average loop lengths and the ILECs actual average loop length, and the similarity in wire center counts; to document all assumptions, inputs, and values consistent with this Order; and to reflect forward-looking technology and the cost of such facilities.

509. The proper cost standard for Phase I is total element long-run incremental cost, and the cost for unbundled network elements should be based upon the cost of the total demand for the elements.



510. Transition costs, including customer transfer cost studies, should be considered in Phase II of this proceeding.

511. The deaveraging of costs should be addressed in the context of universal service, deaveraged retail prices, and inquiry into the extent of competitive activity in this state.

512. The Commission should make the modifications to the assumptions and inputs for the four loop cost models sponsored in this proceeding as described in *Appendix B*, attached and incorporated into this Order by this reference.

513. The wholesale discount should be determined by dividing direct and indirect costs and uncollectible amounts by revenues.

514. U S WEST and GTE should be permitted to file separate avoided cost discounts for operator service and directory assistance and nonrecurring activities.

515. U S WEST and GTE should be required to submit testimony in Phase II of this proceeding describing the degree to which their collocation studies filed in this matter comply and are consistent with the FCC's Physical Collocation Order, including, but not limited to, U S WEST's EICT recurring cost study.

516. GTE should be required to file a revised avoided cost study.

517. The U S WEST and GTE number portability cost studies should be rejected.

518. The parties should file proposed alternatives to the bill-and-keep arrangement for transport compensation in Phase II of this proceeding.

519. GTE should be required to file an electronic version of its nonrecurring cost studies, and to make the following modifications: 1) separate costs for connect and disconnect activities; 2) a narrative explanation of the activity of associated with MARK, CBSS, and Line Screen and their relation to other activities in the model; and 3) incorporate the changes attached as Appendix D to this Order in the cost study.

## ORDER

### THE COMMISSION ORDERS:

520. The versions of the cost models sponsored in Phase I are not in the public interest, and the Commission does not adopt any cost model in this proceeding.

521. The total element long-run incremental cost standard is adopted; the cost of network elements is to be based upon the cost of the total demand for the elements.

522. The cost models should be modified consistent with the evidence of record and used to develop a range of reasonable costs with which to determine appropriate costs.

523. The parties in Phase II must address both the level of transition costs and the appropriate recovery mechanism, and the reasonableness of the proposed customer transfer cost studies.

524. U S WEST must modify its load coil unloading and bridge tap nonrecurring cost studies consistent with our findings in this Order, and file the revised studies no later than 21 days after the date of this Order.

525. The parties in Phase II must address 1) the level of common costs that is to be recovered through the price of unbundled network elements; 2) how individual prices should be determined; and 3) the need to include in the price of the loop the 20% mark-up factor proposed by Commission Staff.

526. Costs for unbundled network elements and interconnection will not be deaveraged in this proceeding.

527. The monthly cost of the unbundled loop for U S WEST is \$17.00; for GTE the is \$20.00.

528. The cost of a four-wire loop is 25% greater than the cost of a two-wire loop.

529. The monthly cost of the port is \$1.29 for both U S WEST and GTE; the per minute cost of the switch is \$0.00115 for U S WEST and \$0.00136 for GTE.

530. The general wholesale discount for U S WEST is 14.69%.

531. GTE is ordered to file an avoided cost study consistent with the letter and spirit of our findings herein no later than 20 days after the date of this Order.

532. U S WEST and GTE must file, and the Commission must approve, avoided cost studies for operator service and directory assistance substantially as recommended by Commission Staff.

533. U S WEST and GTE must file, and the Commission must approve, avoided cost studies for nonrecurring activities. Until such avoided cost studies are approved, the Commission orders that a 50% avoided cost discount applies to retail nonrecurring activities.

534. U S WEST and GTE must modify and refile their collocation studies in a manner that meets the requirements imposed by the FCC's Physical Collocation Order.

535. The cost of providing interim local number portability for both U S WEST and GTE is \$1.50 monthly.

536. The bill-and-keep arrangement for transport compensation should not be disturbed by this Order. If an alternative compensation arrangement is ordered in Phase II of this proceeding, U S WEST and GTE must modify and re-file transport cost studies which reflect the cost of money and depreciation lives we prescribe in this Order.

537. The nonrecurring cost to U S WEST of installing an unbundled loop is \$30.15; the nonrecurring cost of disconnection for an unbundled loop is \$11.58. U S WEST is ordered to modify and refile its other nonrecurring cost studies, in a manner consistent with our findings in this Order, no later than 30 days after the date of this Order. If the revised studies do not reflect both the letter and spirit of our findings, we will apply the identical adjustments to those studies according to those findings.

538. GTE is ordered to modify and refile its nonrecurring cost studies, in a manner consistent with our findings in this Order, no later than 30 days after the date of this Order.

539. U S WEST and GTE must file tariffs to implement the Phase II pricing for the network elements for which we establish costs in this Order.

## **NOTICE OF PREHEARING CONFERENCE**

**(MAY 11, 1998)**

With Phase I of this proceeding completed, the Commission seeks to commence Phase II immediately. The ultimate issue in Phase II is the appropriate prices to be charged by local exchange companies for services, the cost of which was determined by Phase I of this proceeding.

**NOTICE is given that the Commission gives notice that a prehearing conference will be held in Phase II of this matter at 9:30 a.m., Monday, May 11, 1998, in the Commission's Hearing Room, Second Floor, Chandler Plaza Building, 1300 S. Evergreen Park Drive S.W., Olympia, Washington. U S WEST and GTE will distribute at that time the tariffs required by this Order, in two separate formats, the first reflecting prices assuming an equal percentage mark-up over costs consistent with the testimony provided by AT&T and U S WEST, and the second conforming to the market-based pricing approach proposed by GTE, WITA, and Commission Staff.**

If any party or person needs an interpreter or other assistance, please complete the form attached to this notice and return it to the Commission.

ANY PARTY WHO FAILS TO ATTEND OR PARTICIPATE IN THE HEARINGS SET HEREIN, OR OTHER STAGE OF THIS PROCEEDING, MAY BE HELD IN DEFAULT IN ACCORDANCE WITH THE TERMS OF RCW 34.05.440.

DATED at Olympia, Washington, and effective this 16th day of April 1998.

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

/s/  
RICHARD HEMSTAD, Commissioner

/s/  
WILLIAM R. GILLIS, Commissioner

**NOTICE TO PARTIES: This is an Interim Order, and, as such, is not subject to the post-Order review processes of the Administrative Procedure Act. The Commission will entertain requests for clarification of any substantial error of fact and law, but will reject any request which seeks to argue for a different finding or conclusion based upon the record evidence.**

# **APPENDIX “A”**

## **APPENDIX “B”**

### ***Adjustments to the Hatfield Model***

Common Costs	Remove consideration of common costs from Phase I -- zero out common costs. ¶251
Cost of Money	Adopt the cost of money for GTE and U S WEST currently if effect per Commission order: 9.63% for U S WEST and 9.759% for GTE. Exh. 104 at 12-13, and, TLS-3, at 3, 7.
Depreciation	Adopt the projected lives and future net salvage values associated with the depreciation rates for GTE and U S WEST currently in effect per Commission Order. ¶217.
Drop Lengths	For each of the density zones with less than 2,550 lines per square mile, increase drop lengths by 25 feet. The adjustment is based upon data found in the GTE and U S WEST studies, and information collected by the Hatfield engineering team on Washington State loop lengths. No adjustment is made to loop lengths in any other cost studies because no alternative values are proposed. The lack of adjustment to these studies should not be interpreted as an acceptance of the values. ¶134.
External Adjustment for Special Access Line Counts	Adjust the loop cost upward by \$0.66 for U S WEST. Whereas GTE did not propose an adjustment for this item, no change is made to the GTE loop cost estimate. If such data had been provided, an upward adjustment for loop cost likely would result. ¶204.

Fiber/Copper Crossover Point	Adopt a 12,000 feet crossover point. (Implementing this adjustment within BCPM is difficult, since the crossover point is calculated based upon the total distance to the customer, rather than the distance to the serving-area interface. Adopt as an input to BCPM that the maximum loop length for copper is 15,000 feet. ¶198.)
Load Coils	Whereas load coils cannot be removed from the model, factor into the loop cost the likelihood that inclusion of load coils results in an understatement of forward-looking loop costs. ¶145.
Loop Utilization	Adopt default utilization (fill) rate. (Objective fill rates rejected for use in all cost models.) ¶173.
Operations Expense Factor	Adopt an operations expense factor of 70% -- 20% higher than the default value. ¶239.
Placement Costs	Factor into the loop cost the likelihood that cable placement costs are understated. ¶98.
Programing Errors	Correct algorithm errors that omit certain sub-feeder cables and maintenance expenses. ¶109
Structure Sharing	Adopt the structure sharing assumptions at ¶76.
Tax Rates	Adopt a 35% income tax, and 5% other tax, rates. Exh. 104, TLS-3.



**Adjustments to U S WEST RLCAP Model**

Bore Cable	Adopt bore cable factor of five percent placement miles for buried cable. ¶55.
Common Costs	Remove consideration of common costs from Phase I -- zero out common costs. ¶251.
Cost of Money	Adopt the 9.63% cost of money for U S WEST currently in effect per Commission order. Exh. 104 at 12-13, and, TLS-3 at 3, 7.
Depreciation	Take into the account the projected lives and future net salvage values associated with U S WEST's depreciation rates currently in effect per Commission Order. ¶217. RLCAP is not sufficiently flexible to permit a user to directly enter the values adopted in this proceeding.
Distribution Utilization	Increase line count to 1.25 lines per household. ¶180.
Feeder Utilization	Adopt a feeder utilization (fill) rate of 65%. ¶182.
Grooming	Adopt an unbundling cost of \$2.85 in the U S WEST link study. ¶164
Impact of Competition	Factor into the loop cost the likelihood that a drop in market share increases the unit cost. The impact of a decline in installed loops is illustrated in paragraph 201 regarding special access lines. This discussion suggests that a decline in the number of loops does have a significant impact on the unit cost of production.
Structure Sharing	Accept that 18% of the lines are installed in undeveloped areas. The building developer pays for the placement cost. For the developed areas, assign 93% buried and 85% underground structure cable costs to U S WEST. ¶62.

### ***Adjustments to Benchmark Cost Proxy Model***

Common Costs	Remove consideration of common costs from Phase I -- zero out common costs. ¶251.
Cost of Money	Adopt the cost of money for GTE and U S WEST currently in effect per Commission order: 9.63% for U S WEST and 9.759% for GTE. Exh. 104 at 12-13, and, TLS-3, at 3, 7.
Depreciation	Adopt the projected lives and future net salvage values associated with the depreciation rates for GTE and U S WEST currently in effect per Commission Order. ¶217.
Fiber/Copper Crossover Point	Adopt a maximum loop length for copper of 15,000 feet. (Adopt a 12,000 feet crossover point for the Hatfield Model.) Implementing this adjustment within BCPM is difficult, since the crossover point is calculated based upon the total distance to the customer, rather than the distance to the serving-area interface. ¶198.
Impact of Competition	Factor into the loop cost the likelihood that a drop in market share increases the unit cost. The impact of a decline in installed loops is illustrated in paragraph 201 regarding special access lines. This discussion suggests that a decline in the number of loops has a significant impact on the unit cost of production.
Structure Sharing	Adopt the structure sharing assumptions recommended by Commission Staff. Exh. 104, TLS-3, at 4; ¶76.
Tax Rates	Adopt a 35% income tax, and 5% other tax, rates. Exh. 104, TLS-3.

### **Adjustments to GTE Model**

Cost of Money	Adopt the 9.759% cost of money for GTE currently in effect per Commission order. Footnote 25.
Depreciation	Adopt the projected lives and future net salvage values associated with GTE's depreciation rates currently in effect per Commission Order. Footnote 25.
Development of Unit Cost	The model erroneously calculates unit costs. GTE's loop model is a compiled 'C' program; the error is uncorrectable in the model. Factor into the loop cost that this error overstates the cost of the loop. ¶188.
Drop Cost	Due to the erroneous calculation of unit cost, the drop investment is reduced by \$28.00. This is equivalent to a \$0.69 reduction in the cost of the loop. ¶116.
Impact of Competition	Factor into the loop cost the likelihood that a drop in market share increases unit cost. The impact of a decline in installed loops is illustrated in paragraph 201 regarding special access lines. This discussion suggests that a decline in the number of loops does have a significant impact on the unit cost of production.
Loop Utilization	Adopt a 60% utilization (fill) rate for feeder and distribution plant. ¶185.
Structure Sharing	The GTE loop model does not provide the flexibility to alter the assumption of zero structural sharing for underground conduit or buried cable. Factor into the loop cost the that this inflexibility results in an overstatement of loop costs. ¶¶68.

# **APPENDIX “C”**

## **Definitions**

<b>TERM OR ACRONYM</b>	<b>ACRONYM DESCRIPTION</b>	<b>DEFINITION</b>
AD4		Electronic equipment used to convert analog to digital voice signals.
annual charge factor		Annual charge factors are constructed for each investment account. The factors are used to convert an investment value to an annual cash-flow requirement. The cash-flow requirement is the level of annual maintenance, return, depreciation, administrative expenses, and tax expenses associated with a dollar of investment.
ARMIS		Information reporting system established by the Federal Communications Commission.
BCPM	Bench Cost Proxy Model	Cost model that can estimate the cost of providing universal service and unbundled network elements.
carrier serving area interface		The loop is divided into two sections, feeder and distribution. When digital line carrier is used in the feeder section of the loop, the carrier serving area interface are the facilities that connect the digital line carrier with the copper distribution facilities.
CAAS/CARS	Cost Accounting Allocation System/Cost Accounting Reporting System	U S WEST's embedded cost accounting process.
CATV	Cable Antenna Television	Coaxial cable used to transmit television service.
CBG	Census Block Group	Census area of approximately 400 households.
central office		Synonymous with wire center. Like a wire center, the loop is terminated on a frame in the building.
CLECs	Competitive Local Exchange Carriers	A provider of local exchange service that is not an ILEC. A competitive local exchange carrier is a competitor of, among other firms, an ILEC.
cooper cable		Copper wires that are used to transmit digital or analog signals. The copper wires are contained in a plastic sheath.
DACS	Digital Line Carrier	Equipment used to concentrate a number of voice channels on a single pair of fiber optic cable or on two pairs of copper cable.
distribution		The loop is divided into two sections, feeder and distribution. The distribution facilities are located closest to the customer, while the feeder facilities are closer to the carrier's switching machine.
drop		Wire that connects a subscriber's premise to the telephone cable that runs back to the telephone

		company's central office.
DS0		Transmission of one voice channel at 64 kilobits per second. This is the zero-level signal in the time-division multiplex hierarchy.
DS1		Transmission of twenty-four voice channels at 1.544 megabits per second. This is the first-level signal in the time-division multiplex hierarchy.
DS3		Transmission of 672 voice channels at 44.736 megabits per second. In the time division multiplexing hierarchy of the telephone network, DS3 is defined as the third level of multiplexing.
EF&I	equipped, furnished and installed	The total cost of installing equipment. Included in the total cost is both the material cost and the capitalized labor expenditures.
facility		The equipment used to provide service.
FCC	Federal Communications Commission	Federal regulatory agency responsible for regulating interstate and foreign commerce in communication by wire and radio.
feeder		The loop is divided into two sections, feeder and distribution. The distribution facilities are located closest to the customer, while the feeder facilities are closer to the carrier's switching machine.
fiber cable		Tubes that are used to transmit light signals. The tubes are contained in a plastic sheath.
grooming		Digital line carrier enters a central office at a transmission speed, DS1 or higher, that is faster than the transmission speed of an ordinary voice line. The digital line carrier may be transmitting both retail services and unbundled loops. If the unbundled loop, a DS0 signal, must be directly connected to a CLECs equipment, there is a need to separate, or groom, the unbundled loop from the loops used to provide retail services.
HM	Hatfield Model	Cost model that can estimate the cost of providing universal service and unbundled network elements.
ILECs	Incumbent Local Exchange Carriers	On the date of enactment of the Telecommunications Act of 1996, provided telephone exchange service in such areas; and on such date of enactment, was deemed to be a member of the exchange carrier association pursuant to section 69.601(b) of the Federal Communication Commission's regulations (47 C.F.R. 69.601(b)) and on such date of enactment, was deemed to be a member of the exchange

		carrier association pursuant to section 69.601(b) of the Commission's regulations (47 C.F.R. 69.601(b)).
integrated digital line carrier		Equipment used to concentrate a number of voice channels on a single pair of fiber optic cable or on two pairs of copper cable. The equipment is "integrated" when the digital line carrier terminates on the local switching machine.
LIS-Link	local interconnection service links	U S WEST term for loop unbundled loop.
load coils		Equipment used to amplify weak signals. Load coils have historically been installed on loops that provide service to customers that are located far from the nearest central office.
loop		Transmission path between the customer's premise and the exchange carrier's main distribution frame or other designated frame or panel in a wire center which serves the customer.
LTM	Loop Technology Module	GTE model for estimating loop costs.
main distribution frame		The distribution frame in a wire center that is used to interconnect loop cable pairs and line and trunk equipment terminals on a switching system.
NID	network interface device	Equipment at the customer's premise that is the interface between the carrier's loop and the customer's inside wiring.
placement cost		The labor cost of installing equipment.
PNR		PNR and Associates of Jenkintown, PA is a consulting firm that provided the Hatfield Model sponsors with demographic and geological data.
RLCAP	regional loop cost analysis program	U S WEST's model for estimating the cost of the loop.
RUS	Rural Utility Service	Federal agency responsible for maintaining and extending service to rural areas of the country.
SCIS	switching cost information system	Bellcore model used to estimate switching investment levels.
SCM	switching cost module	U S WEST model used to estimate switching investment levels.
special access		A non plain-old telephone service line. Special

access lines come in many different flavors. For example, a special access line could be a low level data transmission service, such as an alarm, as WATS line, or a video-conferencing circuit.

TELRIC  
Total Element Long  
Run Incremental Cost

A measurement of the unit cost of providing a network element. The increment that forms the basis for a TELRIC study shall be the entire quantity of the network element provided.

terminal

UNEs

Unbundled Network  
Elements

Equipment used to terminate a cable.

The term network element means a facility or equipment used in the provision of a telecommunications service. Such term also includes features, functions, and capabilities that are provided by means of such facility or equipment, including subscriber numbers, databases, signaling systems, and information sufficient for billing and collection or used in the transmission, routing, or other provision of a telecommunications service. An unbundled network element is a network element that has been separated for other network elements.

wire center

Building that terminates the loops that connect a customer to a local exchange carrier's switching machine. A wire center serves as an aggregation point on a given carrier's network, where transmission facilities are connected or switched.



## **APPENDIX “D”**

## GTE NRC Studies

GTE is order to refile its NRC studies after making the following changes:

Page	Activity	Work Time	Frequency
002058	Initial Order	10	
002058	Telephone Number Assignment	5	
002058, 002065, 002066	Billing Inquiries	30	5%
002059	Change Order	12	
002060	Billing Inquiries	10	
002062 and 002063	Prepare Circuit Order: Installation Order	30	
002064, 002067	Complete Order: Installation Order	15	
002065	Service Order Entry: Initial Order	10	
002065	Service Order Entry: Change Order	7	10%