

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Joint Application of AT&T Communications of California, Inc. (U 5002 C) and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Switching in its First Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99-11-050.

Application 01-02-024  
(Filed February 21, 2001)

Application of AT&T Communications of California, Inc. (U 5002 C) and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Loops in its First Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99-11-050.

Application 01-02-035  
(Filed February 28, 2001)

Application of The Telephone Connection Local Services, LLC (U 5522 C) for the Commission to Reexamine the Recurring Costs and Prices of the DS-3 Entrance Facility Without Equipment in Its Second Annual Review of Unbundled Network Element Costs Pursuant to Order Paragraph 11 of D.99-11-050.

Application 02-02-031  
(Filed February 28, 2002)

Application of AT&T Communications of California, Inc. (U 5002 C) and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Interoffice Transmission Facilities and Signaling Networks and Call-Related Databases in Its Second Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99-11-050.

Application 02-02-032  
(Filed February 28, 2002)

Application of Pacific Bell Telephone Company (U 1001 C) for the Commission to Reexamine the Costs and Prices of the Expanded Interconnection Service Cross-Connect Network Element in the Second Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99-11-050.

Application 02-02-034  
(Filed February 28, 2002)

Application of XO California, Inc. (U 5553 C) for the Commission to Reexamine the Recurring Costs of DS1 and DS3 Unbundled Network Element Loops in Its Second Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99-11-050.

Application 02-03-002  
(Filed March 1, 2002)

**REBUTTAL DECLARATION OF TREVOR R. ROYCROFT, Ph.D.  
ON BEHALF OF  
THE UTILITY REFORM NETWORK (TURN)**

**March 12, 2003**

**INFORMATION DEEMED "PROPRIETARY" BY SBC PACIFIC HAS BEEN  
DELETED.**

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**I. Preparation**

1. I am the same Trevor R. Roycroft who filed a Reply Declaration in this proceeding on February 7, 2003. In order to prepare this Rebuttal Declaration I examined the Reply Declarations filed by other parties in this proceeding. I also reviewed materials associated with the October 18, 2002 filings. I prepared discovery which was served on SBC Pacific and on Joint Applicants. I reviewed the responses to that discovery, as well as other documents which were associated with the pre-rebuttal phase of this proceeding.

**II. Introduction**

2. The October 18, 2002 filing in this case provided a substantial amount of information for the Commission to consider related to the issues presented in the Scoping Memo. The Reply Declarations filed on February 7, 2003 increased this considerable volume further. The Reply Declarations contain detailed analyses provided by TURN, SBC Pacific, Joint Applicants, and other parties on a variety of specific issues related to the SBC Pacific and HAI cost models. This Rebuttal round will add to the analysis of these competing models. In spite of the sizable volume of information presented to the Commission, the basic issue that the Commission must consider is relatively straightforward, i.e., whether either SBC Pacific's or Joint

Applicants' cost modeling approach is consistent with the forward-looking economic cost principles, as described in Section 51.505 of the Code of Federal Regulations and the relevant portion of the Commission's Consensus Costing Principles. What is abundantly clear from evidence provided by all parties, including SBC Pacific, is that SBC Pacific's models fail to comply with these fundamental requirements for establishing UNE prices. SBC Pacific's approach does not attempt to hide its underlying assumption of the reproduction of SBC Pacific's existing network facilities, a basis for cost estimation which is diametrically opposed to forward-looking economic costing methodology. This inconsistency alone is sufficient for the rejection of SBC Pacific's approach. However, as I discussed in my Reply Declaration, and is discussed in the Reply Declarations of Joint Applicants and XO, SBC Pacific's cost models have considerable problems other than their basic noncompliance with the FCC's TELRIC principles and the relevant portions of the Commission's Consensus Costing Principles.

3. The attempts of Dr. Aron to "validate" UNE prices based on embedded cost methodology in the initial round of declarations have been extended in SBC Pacific's Reply Declarations with Dr. Tardiff's further attempts to validate economic cost estimates by way of comparison to embedded expense and

investment information. As I will discuss further below, validation of a forward-looking cost study by comparing its results to embedded cost data is an economically meaningless exercise. As SBC Pacific's own witness Dr. Aron admits, there is no predictable relationship between embedded costs and economic costs. As a result, the approach that I take in my Reply Declaration, evaluating the HAI model by way of comparison to another cost model which is based on forward-looking economic principles, provides a meaningful benchmark of HAI model performance. This analysis is the basis for my conclusion that the HAI model produces economic cost estimates associated with loop UNEs which are conservatively high as compared to the FCC SM.

4. Having reviewed SBC Pacific's Reply Declarations and the criticism of the HAI model contained therein, I have not found information that leads me to change my belief that the HAI model is consistent with forward-looking economic costing principles and is capable of producing reasonable TELRIC estimates, if an appropriate set of inputs is applied. SBC Pacific's analysis of the HAI model is flawed at several levels. SBC Pacific's witnesses fail to distinguish between alleged flaws in the HAI which reflect user-adjustable inputs and those which reflect the underlying structure of the model (i.e., aspects of the model that cannot be modified with the user-adjustable inputs). Another flaw in the SBC Pacific criticism of the

HAI model relates to any quantification of the magnitude of the impact of the flaws that SBC Pacific alleges exist for the HAI model. As I will discuss further below, SBC Pacific alleges that flaws associated with the HAI's clustering methodology, its treatment of high-rise buildings, its treatment of "core urban areas," or its assumptions about the deployment of block cable "significantly understate" HAI cost output. However, the allegations of understatement are not based on alternative runs of the HAI model or even a full understanding of the impact of the areas at which SBC Pacific levels criticism. As I will discuss further below, measurement of the impact of the HAI shortcomings alleged by SBC Pacific leads me to conclude that either very small changes in the cost estimates of the HAI model result, or the exact opposite of the understatement in loop costs which SBC Pacific's claims. I.e., altering the HAI in a manner consistent with SBC Pacific's criticism actually *reduces*, rather than increases, the HAI cost estimate. In other words, SBC Pacific misidentifies conservative assumptions that actually place upward pressure on the HAI's cost estimates as assumptions which place downward pressure on cost estimates.

5. As I indicated in my Reply Declaration, I believe that the Commission should adopt the HAI model to provide the foundation for TELRIC estimates. I recommend that the Commission adopt the general platform of the FCC SM inputs (along with the

proprietary cable costs), but advise the Commission to avoid the FCC's 11.25% weighted cost of capital as it is likely that such a value is high given forward-looking conditions in capital markets. The Commission may ultimately decide that certain input values should be modified from my recommended levels. However, the HAI model easily allows such a modification and will flow-through the adjustment to the various components of the model. Similar flexibility is impossible with the SBC Pacific models as they are fragmented and do not provide many user-adjustable inputs, in addition to beginning from the wrong point, i.e., SBC Pacific's embedded plant.

6. Before proceeding, a note on terminology. As I discussed in my Reply Declaration, I utilized assumptions from the FCC SM input platform in alternative runs of the HAI model. However, I retained the HAI model's use of proprietary SBC Pacific information regarding copper and fiber cable prices. I also applied these proprietary copper and fiber cable prices with my comparative run of the FCC SM. In this Rebuttal Declaration I make reference to the output of these HAI and FCC SM model runs which were discussed in my Reply Declaration. To conserve notation, in this Rebuttal Declaration I will refer to the input values which include the FCC SM default values and the proprietary cable prices as the "FCC SMPC input platform." The input values associated with the FCC SMPC are shown in Appendix 1 of this

Rebuttal Declaration and are the same input values that I used to generate the model run output for the HAI and FCC SM that was discussed in my Reply Declaration.<sup>1</sup>

### **III. Analysis of Dr. Tardiff's Reply Declaration**

#### **A. The FCC and "Actual" Costs**

7. Dr. Tardiff begins his Reply Declaration with a discussion of "economic issues." However, rather than describing the role of forward-looking principles which are appropriately associated with TELRIC studies, he develops an elaborate argument which attempts to convince the reader that TELRIC is associated only with the incumbent carrier's "actual forward-looking costs."<sup>2</sup> Dr. Tardiff indicates by citation that this is the FCC's position. A careful reading of the *Local Competition Order*<sup>3</sup> does not support Dr. Tardiff's position. The FCC does not indicate that the forward-looking costs associated with UNEs and interconnection must be those that

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<sup>1</sup> The FCC SM and HAI output using the FCC SMPC input platform is summarized in Table 2 of my Reply Declaration and is supported by the files "FCC\_SM\_CA\_Pacific Bell\_2001\_Lines\_Proprietary\_Inputs(2-4-03).xls" and "HAI\_CA\_Pacific Bell FCC\_SM\_Direct\_2-5-03\_WC.xls" which are contained in Attachment TRR-3 of my Reply Declaration.

<sup>2</sup> Dr. Tardiff's Reply Declaration, p. 7.

<sup>3</sup> In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, *First Report and Order*, FCC 96-325 (rel. Aug. 8, 1996). (Hereinafter, *Local Competition Order*).

the incumbent is actually incurring:

We believe that our adoption of a forward-looking cost-based pricing methodology should facilitate competition on a reasonable and efficient basis by all firms in the industry by establishing prices for interconnection and unbundled elements based on costs *similar* to those incurred by the incumbents. . .<sup>4</sup>

Furthermore, the similarity of the costs to the incumbents was strictly delineated by the methodology selected by the FCC. The FCC identified three possible approaches to the calculation of forward-looking costs.

- (1) Under the first approach, the forward-looking economic cost for interconnection and unbundled elements would be based on the most efficient network architecture, sizing, technology, and operating decisions that are operationally feasible and currently available to the industry.<sup>5</sup>
- (2) Under the second approach, the costs of interconnection and unbundled network elements would be based on existing network design and technology that are currently in operation. Because this approach is not based on a hypothetical network in the short run, incumbent LECs could recover costs based on their existing operations, and prices for interconnection and unbundled elements that reflect inefficient or obsolete network design and technology. This is essentially an embedded cost methodology.<sup>6</sup>
- (3) Under the third approach, prices for interconnection and access to unbundled elements would be developed from a forward-looking economic cost methodology based on the most efficient technology deployed in the incumbent LEC's current wire center locations. This approach mitigates

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<sup>4</sup> *Local Competition Order*, ¶679.

<sup>5</sup> *Local Competition Order*, ¶683.

<sup>6</sup> *Local Competition Order*, ¶684.

incumbent LECs' concerns that a forward-looking pricing methodology ignores existing network design, while basing prices on efficient, new technology that is compatible with the existing infrastructure. This benchmark of forward-looking cost and existing network design most closely represents the incremental costs that incumbents actually expect to incur in making network elements available to new entrants. . . . *We, therefore, conclude that the forward-looking pricing methodology for interconnection and unbundled network elements should be based on costs that assume that wire centers will be placed at the incumbent LEC's current wire center locations, but that the reconstructed local network will employ the most efficient technology for reasonably foreseeable capacity requirements.*<sup>7</sup>

It is important to note from ¶685 of the FCC's *Local Competition Order*, cited immediately above, that the incremental costs which the incumbents "actually expect to incur" are those associated with a reconstructed local network that will employ "the most efficient technology for reasonably foreseeable capacity requirements," not the actual costs of their existing network. Thus, the FCC's statement regarding the costs that incumbents "actually expect to incur" rejects the embedded cost approach.

8. Dr. Tardiff points to statements made by the FCC in its final brief filed before the U.S. Supreme Court in the *Verizon v. FCC* case as providing the "definitive" support for the proposition that the actual costs of the ILEC are the appropriate focus of TELRIC. The FCC does provide a rather illuminating discussion of this point in that

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<sup>7</sup> *Local Competition Order*, ¶685, emphasis added.

brief and the FCC’s full statement on this matter places Dr. Tardiff’s cited fragment into its proper context and shows that Dr. Tardiff’s claim is unsupported:

The incumbents argue that any reasonable forward-looking methodology would have to be tied to their “actual” forward-looking costs, as opposed to the forward-looking costs of a “hypothetical” carrier. But they do not explain what they mean by “actual” forward-looking costs. By definition, forward-looking costs, in contrast to historical costs recorded in the regulatory books of account, do not replicate actual past outlays. They are instead “the costs that a carrier would incur in the future.” The costs measured by TELRIC are nonetheless those of the incumbent itself. Those costs are based, moreover, on actual prices of equipment that is commercially available today—equipment that carriers are already using to upgrade and expand their networks.

The incumbents appear to be proposing a methodology based on “actual” cost, in today’s market, of duplicating “actual” existing networks in all physical particulars—or, stated differently, the “application of up-to-date prices to out-of-date properties.” Economists, including those upon whom the incumbents rely, uniformly agree that such a measurement is “economically meaningless.” The FCC considered, but rejected, such an approach as “essentially an embedded [i.e., historical] cost methodology,” which would produce “prices for interconnection and unbundled elements that reflect inefficient or obsolete network design and technology.”<sup>8</sup>

A fragment of the above quotation is relied upon by Dr. Tardiff to support his position that TELRIC is intended to identify an incumbent carrier’s actual costs.

However, when placed into the context of the FCC’s discussion, the alleged FCC support for the use of actual costs is simply not reflected in the FCC’s statement.

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<sup>8</sup> Reply Brief of the Petitioners United States and the Federal Communications Commission. *Verizon Communications, Inc., Et Al. v. Federal Communications Commission, Et Al.* July 2001, pp. 6-7, citations omitted.

Rather, the FCC explicitly rejects the approach taken by SBC Pacific in this proceeding, i.e., calculating the cost of duplicating their actual network facilities. According to the FCC, the costs of the incumbent are measured with TELRIC, but they are not the actual costs of duplicating the existing network. Instead, starting from the placement of existing wire centers and then applying efficient network design principles structured to meet reasonably foreseeable demand, TELRIC estimates the costs that an incumbent would incur under forward-looking conditions. In describing the prices for the appropriately considered equipment associated with a TELRIC study, the FCC does not identify the equipment that is already deployed by a carrier, but rather the equipment “that carriers are already using to upgrade and expand their networks.” Thus, the Commission should reject Dr. Tardiff’s perspective as it would result in the “application of up-to-date prices to out-of-date properties” and produce “prices for interconnection and unbundled elements that reflect inefficient or obsolete network design and technology.”

**B. Dr. Tardiff and the Validation of the HAI**

9. Dr. Tardiff proposes a validation test for the HAI model based on a comparison of SBC Pacific’s actual investment and actual expenses with those produced by the HAI model. This approach to validation is not appropriate as it compares historical

embedded investments and the expenses associated with those investments with forward-looking investments and their associated expenses. Dr. Tardiff's validation approach suffers from the same basic flaw as Dr. Aron's embedded cost based analysis of necessary cash flows which I discussed in my Reply Declaration, i.e., the approach is not economically meaningful and is based on criteria which the FCC has specifically rejected with regard to establishing prices for interconnection and UNEs.

10. In markets which are subject to competitive forces, booked investments, and expenses associated with those booked investments, do not influence prices for products sold at the retail level or inputs which may be sold at the wholesale level. Absent barriers to entry, new market entrants are free to choose from the overall mix of available technology, including state-of-the-art technology which delivers the least-cost means of providing the good or service. To the extent that previous generations of technology exist as inputs which could be selected by the entrant, market forces will adjust the prices of the less efficient technology in light of efficient new technologies. The less efficient inputs' book prices will bear no relationship to their market prices. Dr. Tardiff indicates that both expenses and investment are best checked by use of their associated historical or embedded levels. I will illustrate the flaws in his argument by example, first discussing

expenses and then turning to investment.

11. An illustration of the lack of economic relevance and inconsistency with TELRIC of Dr. Tardiff's approach with respect to expenses is nicely illustrated by a recent *Wall Street Journal* article. The article discusses the retirement of the last Boeing 727 jet from U.S. carriers' scheduled airline service, which will occur in April 2003 when Delta Airlines decommissions its final 727.<sup>9</sup> At one time the Boeing 727 was the state-of-the-art passenger aircraft. However, over time it was surpassed by other aircraft models.
  
12. When considering the application of forward-looking cost methodology to the production of airline flights, an approach similar to TELRIC would establish the least-cost forward-looking means of providing flights, given existing airport locations.<sup>10</sup> The inappropriateness of Dr. Tardiff's methodology which compares forward-looking expenses with those associated with embedded investment can be seen in the following:

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<sup>9</sup> Scott McCartney. "Final flight of Boeing's 727 by U.S. Carriers is a Milestone," *Wall Street Journal*, February 12, 2003.

<sup>10</sup> As will be discussed shortly, it is possible that an efficient carrier might choose a mix of aircraft that was not exclusively state-of-the-art. However, competitive market forces would not allow the prices for obsolete aircraft to reflect their embedded investment. Similarly, forward-looking expenses would not be accurately represented by those associated with an incumbent carrier's embedded fleet of aircraft.

Between 1964 and 1984, Boeing produced 1,832 727s. But what once was economical proved to be too expensive over time. Boeing began designing jets with two engines, instead of three, and two pilots, instead of three. The Boeing 757 had more seats than the 727 and transcontinental range. It was far more economical. The Boeing 737 was smaller and cheaper to fly, and could profitably serve even smaller cities, or provide frequent service attractive to business travelers. The 737 became Boeing's best-selling plane, eclipsing the 727. And Airbus came up with the A320, a plane with a wider fuselage to offer a bit more passenger comfort, not to mention faster speed and longer range. A 727 consumes about 1,260 gallons of jet fuel an hour, while an A320, carrying the same number of seats, burns on 788 gallons an hour.

Today, the market has evolved beyond just replacing three-engine, three-pilot jets with two-engine, two-pilot planes. The economics of the industry, and the capabilities of airplanes, now dictate that small 50-seat regional jets fly to many of the very same small cities that saw the 727 as their first commercial passenger jet. Using a 150-seat jet to fly to Amarillo, Texas, seems like a silly proposition these days. Three 50-seat regional airline flights offer better revenue potential to carriers than one 150-seat mainline flight. Believe it or not, the three small-jet flights also offer lower costs in terms of crews and fuel.<sup>11</sup>

13. Applying Dr. Tardiff's logic to expenses associated with the technological and market evolution associated with the Boeing 727 scenario provides a clear example of the economically meaningless nature of expenses associated with embedded investments. If an incumbent carrier with an embedded base of 727 aircraft predicted its labor costs, the costs would be associated with the use of three pilots on each flight. That same carrier predicting fuel usage for each 727 flight would identify 1,260 gallons per hour. It is clear that this is a very poor predictor of the

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<sup>11</sup> "Final Flight of Boeing's 727 by U.S. Carriers is a Milestone." Scott McCartney, *Wall Street Journal*, February 12, 2003.

expenses associated with the forward-looking technology associated with serving a route. For a new entrant at the time the Airbus A320 came onto the market, forward-looking labor expenses for an entrant could be reduced by as much as 33% as compared to the 727, as the Airbus A320 only requires two pilots. Given the lower fuel consumption associated with the Airbus A320, fuel expenses could be reduced by as much as 38% compared to the incumbent's embedded 727 baseline. No new entrant would base its entry decisions on the assumption that its operating expenses would be constrained by the same levels of expenses associated with the incumbent's fleet of 727s. This example illustrates the problem with Dr. Tardiff's analysis of expenses. The comparison of HAI expense levels with those associated with SBC Pacific's existing (embedded) based of operations is economically meaningless and cannot be used to validate the expense levels associated with the HAI model any more than the expense levels associated with operating a Boeing 727 can be used to validate the expenses associated with operating an Airbus A320 or fifty-seat regional jet.

14. Turning to the issue of investment, applying TELRIC principles to the airline example would recognize the fact that a new airline would have the option of purchasing or leasing either new state of the art aircraft or less efficient used aircraft. A new entrant in the local exchange will not find much of a secondary

market for most UNEs, especially for UNE loops. However, market forces associated with the sale or lease of aircraft would not allow the book investment values associated with inefficient aircraft to have any influence on the market price of such aircraft that might be considered for lease or purchase by a new entrant. The FCC addressed this issue in its final brief in the *Verizon* case:

The incumbents assert that TELRIC assumes that a carrier would scrap its existing network and rebuild a new, more efficient one every time an advance in technology occurs. TELRIC assumes no such thing.

TELRIC instead rests on the rational economic assumption that, as new, more efficient equipment becomes available, the value of older, less efficient equipment will be affected. To use an example suggested by the incumbents, if new more fuel-efficient aircraft were to become available, airlines would not necessarily respond by immediately replacing their older, less fuel-efficient aircraft, which could still have a significant useful life. The relevant point is that the market value of the older aircraft would depend *not* on what the owner originally paid for it, but on the cost of continuing to operate it relative to the cost of acquiring and operating the new equipment. Thus, if an airline were to offer to sell or lease its older aircraft, the price at which it could do so would be constrained by the cost of acquiring and operating the new aircraft. Airlines considering whether, or how, to enter the market would base their decision, in significant part, on that cost. To serve its goals of promoting competition and efficiency in local telecommunications markets while providing fair compensation to incumbents, the FCC similarly required state commissions to use the long-run forward-looking costs of providing network elements using the most efficient technology currently available.<sup>12</sup>

This statement by the FCC clearly illustrates why Dr. Tardiff's proposal to validate

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<sup>12</sup> Reply Brief of the Petitioners United States and the Federal Communications Commission. *Verizon Communications, Inc., Et Al. v. Federal Communications Commission, Et Al.* July 2001, pp. 7-8, italic emphasis in the original, underlined emphasis added, citations omitted.

the HAI model by way of embedded investments is entirely inconsistent with the most basic economic principles. If market forces did exist for the provision of UNEs, the same constraints would apply to an ILEC as apply to an airline planning on leasing aircraft that was not efficient, i.e., “the market value of the older aircraft would depend *not* on what the owner originally paid for it.”<sup>13</sup> Unlike the market for the lease or purchase of used aircraft, which subject to some competitive forces, the market for UNEs is not. Given the lack of market forces, regulators must replicate the outcome that would be expected if the market were competitive, i.e., “if an airline were to offer to sell or lease its older aircraft, the price at which it could do so would be constrained by the cost of acquiring and operating the new aircraft.” The use of forward-looking economic costs as mandated with the FCC’s TELRIC is the only way to replicate this market outcome.

15. Thus, Dr. Tardiff’s alleged validation of the results of a forward-looking economic cost model by way of embedded investments and of the expenses associated with those embedded investments is incorrect and economically meaningless. If an

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<sup>13</sup> These market forces are familiar to consumers as well. The owner of a four-year-old personal computer may have paid \$2,000 for a machine with a 500 megahertz processor and 128 Megabytes of RAM when new in 1999. However, even if the machine sat unopened in its box and suffered no wear and tear in the intervening four years, the market value is no longer \$2,000. Given current PC prices and the advance of technology in the intervening period, the 1999 machine is obsolete and would likely have a market value less than one-tenth of its original price.

incumbent airline operating a fleet of Boeing 727s were to claim predatory “below cost” pricing on the part of an entrant which operated a fleet of Airbus A320s based on an evaluation of the *incumbent’s* costs, it could not make its case—the rivals’ costs, based on efficient technology are what matters from an economic and legal perspective. Similar logic applies to forward-looking economic costs associated with UNEs. The claim that embedded costs should be used to determine the TELRIC-compliance of UNE prices is fallacious. Absent a competitive market for the production of UNEs, it is what forward-looking cost models have to say that matters when determining UNE prices.

16. The discussion above is also relevant when considering lack of economic meaning associated with Dr. Aron’s comments regarding the relevance of booked costs.<sup>14</sup> Dr. Aron argues that “an analysis of booked costs can serve as a check on the reasonableness of results of a forward-looking model,” and that “costs produced by a model that are totally out of line with actual experience are an indication that the model has fundamental flaws. . . .”<sup>15</sup> However, this point of view is contradicted by none other than Dr. Aron when she indicates that “forward-looking hypothetical

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<sup>14</sup> Dr. Aron’s Reply Declaration, pp. 6-9.

<sup>15</sup> Dr. Aron’s Reply Declaration, p. 6.

costs can be higher or lower than actual booked costs.”<sup>16</sup> If there is no definite relationship between booked costs and forward-looking costs, then use of booked costs as a “reality check” cannot provide much guidance. A far superior “reality check” is the comparison of estimates produced by forward-looking cost models which are consistent with TELRIC principles, as I provided in my Reply Declaration with the comparison of the HAI and FCC SM.

**C. Dr. Tardiff and High-Rise Buildings**

17. Similar to Mr. Murphy’s criticism of the HAI model with regard to “core areas” (which will be discussed further below), Dr. Tardiff provides criticism of the HAI model’s capabilities associated with high-rise buildings.<sup>17</sup> I will discuss the problems with Mr. Murphy’s criticism on this matter later in this Declaration and the problems with Mr. Murphy’s position apply equally to Dr. Tardiff’s comments on this issue. My analysis, discussed in detail below, indicates that the HAI model produces results which are conservatively high for the very core urban areas where Mr. Murphy and Dr. Tardiff indicate that the HAI produces costs which are “substantially” understated.
18. Furthermore, I would encourage the Commission to consider the capabilities of a

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<sup>16</sup> Dr. Aron’s Reply Declaration, p. 8.

<sup>17</sup> Tardiff Reply Declaration, p. 46.

cost model at the level of aggregation that matters. Dr. Tardiff's and Mr. Murphy's approaches to the HAI model attempt to obscure HAI's "TELRIC forest" with selected leaves from a few trees. Given the existence of three UNE zones in California, the assessment of model results is appropriately based on weighted average TELRIC estimates at the zone level. As is noted by Dr. Aron, "no TELRIC model is perfect."<sup>18</sup> I too would expect that there would be variation associated with any TELRIC model's accuracy of estimating loop costs on a loop-by-loop basis, which is the perspective which SBC Pacific takes in its Reply criticism. However, the smallest level of granularity of cost output provided by the models under consideration in this proceeding is at the wire center level, not the individual loop level. The models produce output associated with wire centers such as "ACTNCA11" or "UNCYCA11," not with 711 Van Ness Avenue, San Francisco or 2434 Marconi Ave., Sacramento. On a loop-by-loop basis I would expect that there would be a degree of underestimation for some loops and some degree of overestimation for other loops. In an unbiased model this variation will average out over the number of loops which are typically associated with a wire center, i.e., the smallest level of aggregation reported by all of the cost models presented in this proceeding. This averaging process is taken to an even higher level with the creation

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<sup>18</sup> Dr. Aron's Reply Declaration, p. 6.

of weighted average costs associated with the three zones. Zone 1 contains approximately 180 wire centers and approximately 11 million loops. Zone 2 contains over 170 wire centers and approximately 5 million loops. Zone 3 contains over 240 wire centers and approximately 1.3 million loops. Thus, SBC Pacific's microscopic loop-by-loop focus on alleged problems does not provide a valid basis for then painting the HAI model with a broad brush as a failed model.

19. As I explained in my Reply Declaration, considering the results of the HAI model when compared with another forward-looking cost model, the FCC SM, leads me to conclude that at the level of aggregation that is relevant to this proceeding, i.e., the three zones associated with UNE loop rates, the HAI model provides a conservatively high estimate of the monthly recurring cost, when the model is run with the FCC SMPC input platform. It is possible that certain loops in the overall set of loops in one of the three zones have their costs underestimated by the HAI. But what my analysis indicates is that the HAI model does not systematically underestimate loop costs when its results are considered at the 3-zone level (or even at the wire center level in San Francisco which is the focus of Mr. Murphy's analysis of core urban areas, see below). This would indicate that those loops which may have costs underestimated are more than offset by other loops which have their costs overestimated by the model, resulting in an overall weighted average loop cost

which is uniformly higher than that produced by the FCC SM.

**D. Dr. Tardiff and Cable Materials Prices**

20. Dr. Tardiff makes contradictory statements regarding cable materials prices which are used by Joint Applicants in the HAI model. I utilized these cable prices as I believe they were appropriate company-specific input values to employ in the HAI model. I also applied these values in the FCC SM model runs which I used to benchmark the performance of the HAI model. In answer 52 of Dr. Tardiff's reply declaration he indicates that these are materials prices "which he (Mr. Donovan) describes as coming from an SBC California data request response." Later in his declaration (answer 113), Dr. Tardiff states that "Mr. Donovan used data obtained from SBC California in discovery for cable materials." As these two statements, while contradictory, cast doubt on the origin of the cable prices, I requested through discovery the foundational information on cable materials prices from Joint Applicants. I have examined the information from which Joint Applicants' developed their materials prices for copper and fiber cable and found it to accurately reflect information provided by SBC Pacific related to recent copper and fiber cable purchases and the prices paid by SBC Pacific. My review of Joint Applicants' basis for cable material prices indicates that Dr. Tardiff's second statement on this matter is correct, i.e., Joint Applicants are in fact utilizing proprietary cable prices which

correctly reflect the cable materials prices in question.

**E. Dr. Tardiff and the Complexity of the HAI Model**

21. Dr. Tardiff indicates that the “complexity of HM 5.3 inhibits a detailed understanding of its calculations and auditing of its inputs and outputs.”<sup>19</sup> I am not quite sure what Dr. Tardiff expects given the nature of the issue at hand, i.e., developing forward-looking economic costs for the provision of multiple UNEs for a local exchange carrier of the size of Pacific Bell. This is a complex problem. However, I believe that if Dr. Tardiff had analyzed the SBC Pacific cost studies and models filed in this proceeding he would have found them to be more complex.<sup>20</sup> As is noted by XO witness Mr. Montgomery, the main workbook for the HAI model utilizes about 32 interlinked worksheets, where the SBC Pacific Annual Charge Factor model alone has 60 interlinked sheets. LoopCAT has 39 interlinked sheets, and Spice has eight interlinked sheets.<sup>21</sup> Thus, on the basis of the structure of associated Excel workbooks, the SBC Pacific models provide a more dense

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<sup>19</sup> Tardiff Reply Declaration, p. 41.

<sup>20</sup> In response to Joint Applicants Data Request 1144 SBC Pacific indicates that Dr. Tardiff was only provided portions of SBC Pacific’s cost studies and models associated with the October 18, 2002 filing. SBC Pacific’s response to Joint Applicants Data Request 1105 also indicates a limited examination of SBC cost models by Dr. Tardiff.

<sup>21</sup> Montgomery Reply Declaration, p. 8.

underbrush of individual worksheets than does the HAI model. SBC Pacific also bests the HAI model with regard to the number of separate workbooks which must be accessed to identify and audit inputs associated with the model. The HAI provides a summary of input values and their justification with its “Input Portfolio.” Support for inputs with the SBC Pacific models is scattered within multiple Excel workbooks which frequently contain multiple worksheets. Given the nature of the problem under consideration, I do not think that Dr. Tardiff’s criticism of the complexity of the HAI model is reasonable.

22. Dr. Tardiff also points to some formulae which he has extracted from individual cells of Excel worksheets associated with the HAI model as examples of the difficulty in auditing the HAI calculations. The formulae reproduced on pages 41 and 42 of Dr. Tardiff’s Reply Declaration are complex, but they can be audited by someone who is familiar with the operations of Excel. It may not be a blissful task, but it can be done. However, SBC Pacific models frequently present an auditing problem that is much more daunting than those represented by Dr. Tardiff on pages 41 and 42 of his reply declaration. For example, when examining the LoopCAT model, it is quite common to find something similar to the following in a cell associated with an important input value:

0.75

While this type of hard coded number appears to be much more simple than the type of spreadsheet formulae identified by Dr. Tardiff on pages 41 and 42 of his reply declaration, it presents a much more complex problem to anyone wishing to audit the cell. In order to audit this aspect of the LoopCAT model, the auditor does not have an electronic trail to follow, as is the case with the type of formulae which Dr. Tardiff criticizes. Thus, if there is no clue provided for the origin of the number, then the auditor is forced to plough through voluminous workpapers or possibly rely on discovery to identify the foundation associated with a particular cell value. Thus, the existence of formulae which identify the foundation for a cell value within a spreadsheet often provide a much more efficient mechanism for auditing the content of an Excel workbook.

23. Dr. Tardiff goes on to complain about the existence of certain “hard coded” numbers which are associated with some formulae contained in the HAI model. If hard-coded numbers are a fatal flaw in a cost model, then as discussed above, SBC Pacific models also have some serious problems.

#### **IV. Analysis of the Reply Declaration of Francis J. Murphy**

##### **A. “Black Boxes”**

24. Mr. Murphy’s Reply Declaration offers ample criticism of the HAI model. In general, Mr. Murphy’s Reply Declaration claims that the HAI model “does not

conform to the Commission’s cost modeling criteria<sup>22</sup> and that the HAI model “contains significant flaws in its platform assumptions and input values.”<sup>23</sup> As I will discuss in more detail below, the basic problem with Mr. Murphy’s assessment is that it fails to properly distinguish between the user-adjustable inputs in the HAI model and the structure of the HAI model which cannot be influenced by the user-adjustable inputs. Mr. Murphy’s statement is also made without the benefit of any in-depth evaluation of the other competing cost model in this proceeding, i.e., Pacific Bell’s cost studies. In response to discovery regarding Mr. Murphy’s evaluation of the SBC Pacific cost models, SBC Pacific indicates “Mr. Murphy is generally familiar with Pacific’s cost studies in this proceeding. Mr. Murphy reviewed those studies but did not conduct any in-depth analyses.”<sup>24</sup>

25. Mr. Murphy indicates that the customer location database associated with the HAI model is a “black box” which cannot be adequately audited. Mr. Murphy does not level this criticism at other aspects of the HAI model. SBC Pacific’s models have significant problems, some of which I discussed in my Reply Declaration. However, it is important to emphasize: SBC Pacific’s models, as they are unintegrated,

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<sup>22</sup> Murphy Reply Declaration, p. 4.

<sup>23</sup> Murphy Reply Declaration, p 11.

<sup>24</sup> Response to Joint Applicants’ Data Request 1106.

provide a “black box” problem of their own. For example, the SBC Pacific LoopCAT model separately and independently estimates the costs associated with 2-wire loops, 4-wire loops, BRI loops, coin loops, DS1 loops, PBX loops, and DS3 loops. This approach opens the possibility of double-recovery. Auditing the potential for double recovery is much more difficult than if a single integrated model had been utilized.

26. SBC Pacific’s SPICE model also has “black box” problems based on the cumbersome and complex nature of the model. TURN was provided with a computer which contained a copy of the SPICE model and its associated Oracle database. My investigation of the model led me to conclude that auditing the model would take an extensive amount of time. After consultation with TURN, it was decided to not address the SPICE model. Thus, Joint Applicants’ criticism of the SPICE model is consistent with my experience.<sup>25</sup> XO’s witness Mr. Montgomery also had difficulty with the SPICE model. Apparently due to the lack of access to the Oracle database Mr. Montgomery made his modifications to SPICE “by

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<sup>25</sup> “SPICE is extraordinarily difficult to install and configure properly, which is a result of the model design as well as SBC Pacific’s failure to provide adequate documentation and technical assistance.” Mercer and Murphy Reply Declaration, ¶ 9.

manually changing the SPICE output files” rather than running the model.<sup>26</sup>

**B. Mr. Murphy and User-Adjustable Inputs**

27. As I mentioned above, Mr. Murphy’s analysis of the HAI fails to properly distinguish between issues which are structural and those which are associated with the user-adjustable input values in the HAI model. In my Reply Declaration I addressed the user-adjustable input values associated with the HAI model and showed that by applying the FCC SMPC input platform, the HAI model produces loop cost estimates which are conservatively high when compared to the cost estimates associated with the FCC SM. Thus, Mr. Murphy’s Reply Declaration must be carefully examined to separate those issues which are easily addressed by modifying user-adjustable inputs and those issues which are associated with the model’s underlying structure, i.e., aspects of the model which cannot be addressed through the user-adjustable inputs.
28. Mr. Murphy identifies a number of areas where he believes that the HAI model “significantly understates” costs, including those associated with rights-of-way, platform assumption and input values, and “block” aerial distribution cable.<sup>27</sup> In response to discovery, however, Mr. Murphy indicates that he has not conducted any

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<sup>26</sup> Reply Declaration of Mr. Montgomery, p. 16.

<sup>27</sup> Murphy Reply Declaration, pages 6, 11, 32.

studies or analysis which would allow him to identify the magnitude of these alleged understatements.<sup>28</sup>

**C. Mr. Murphy and Block Cable**

29. Mr. Murphy spends a good deal of time addressing the “block cable” assumptions which are used by the HAI model. The term block cable is utilized by Joint Applicants to identify cable which is supported directly on buildings rather than by poles or other placement.<sup>29</sup> Mr. Murphy indicates that block cable is inconsistent with actual practices and is “simply absurd.”<sup>30</sup> The issue of block cable illustrates one of the advantages of the HAI model. Namely, the user-adjustable inputs allow the user to specify the amount of block cable to be included in the network design. Thus, if the Commission disagrees with Joint Applicant’s inclusion of block cable, then the values may be altered and the model may be easily rerun to generate the alternative cost estimate.<sup>31</sup>
30. This ability of the HAI model to perform alternative runs with modified assumptions

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<sup>28</sup> Responses to TURN’s Data Requests 4-4, 4-5, and 4-8.

<sup>29</sup> Declaration of Mr. Donovan, p. 15.

<sup>30</sup> Murphy Reply Declaration, p. 36.

<sup>31</sup> In the HAI default assumptions, block cable is assumed to be utilized as the distribution support structure with 10% and 30% occurrence in, respectively, the second highest and highest density zones.

also helps to evaluate the criticism leveled by Mr. Murphy that the block cable “assumption *significantly* reduces the loop UNE cost estimates in the core area.”<sup>32</sup>

To test Mr. Murphy’s claim, I performed an alternative run of the HAI model, starting from the baseline which I discussed in my Reply Declaration, i.e., the HAI with the FCC SMPC input platform. I adjusted the user-adjustable input assumptions to eliminate block cable from the HAI model and reran the model. The impact of the elimination of the use of block cable was to increase the direct monthly recurring loop cost estimated by the HAI by an average of \$0.004 per loop, i.e., by four-tenths of one cent. Thus, while Mr. Murphy takes issue with the use of block cable, with five pages of his Reply Declaration being devoted to the subject, the bottom line on this issue is that it is of little consequence to the cost estimates produced by the HAI.<sup>33</sup>

**D. Mr. Murphy and Structure Sharing**

31. Mr. Murphy and Dr. Tardiff are critical of the model’s structure sharing assumptions. Structure sharing can be addressed in the HAI model through the user-

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<sup>32</sup> Murphy Reply Declaration, p. 32, emphasis added.

<sup>33</sup> The alternative HAI model run which zeros-out the block cable is included in Attachment TRR-R1 as the file “CA\_Pacific\_Bell\_HCPM\_FCC\_SM\_no\_block(proprietary).xls”. A workpaper providing the \$0.004 cost per loop calculation is provided in Attachment TRR-R1 as the file “Block\_Cable\_Impact.xls”.

adjustable inputs. Appendix 1 shows the default values associated with structure sharing from the HAI, as presented by Joint Applicants, and the default structure sharing values from the FCC SMPC input platform, which I applied in my alternative runs of the HAI model. Mr. Murphy is correct that most of the default values selected by Joint Applicants will result in lower cost estimates. As can be seen in Appendix 1 Joint Applicants generally have applied structure sharing assumptions which result in a smaller fraction being assigned to the telephone company. The smaller fraction assigned to the telephone company will result in lower costs.<sup>34</sup> However, Mr. Murphy's criticism of the structure sharing values overlooks the advantage associated with the HAI model—the user can easily modify the structure sharing values to generate alternative cost estimates as I did in my Reply Declaration.

**E. Mr. Murphy and Riser Cable**

32. Mr. Murphy indicates that the HAI model's use of riser cable is inappropriate as it assumes that riser cable is provided by SBC Pacific, a situation which does not comport with SBC Pacific's actual practice.<sup>35</sup> Riser distribution cable is utilized in

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<sup>34</sup> The FCC SM and Joint Applicant values for structure sharing are identical for distribution and feeder aerial plant in the "0" density zone.

<sup>35</sup> Murphy Reply Declaration, p. 36.

multi-tenant buildings such as high-rise apartments. Riser cable is a user-adjustable input which may be zeroed-out in the HAI user interface. However, it is also worth noting that the HAI model's use of riser cable is *conservative*, i.e., if it is not provided by SBC Pacific as Mr. Murphy suggests, its presence in the HAI model then overstates distribution plant costs and thus loop costs.

**F. Mr. Murphy and Pole Sizing and Spacing**

33. Mr. Murphy is critical of pole sizing and pole spacing assumptions included in the HAI model.<sup>36</sup> Mr. Murphy notes that the HAI model employs pole sizing and spacing assumptions from the nationwide default values of the FCC SM. Pole investment values and spacing are also user-adjustable inputs, thus they may be modified. Mr. Murphy states that the FCC has indicated that it might be appropriate to revisit the pole sizing and spacing assumptions in future. If the FCC has made such a statement, the FCC has not revised these values.<sup>37</sup> Furthermore, FCC SM output using the default pole size and spacing has been utilized by the FCC when evaluating whether UNE rates are TELRIC compliant.

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<sup>36</sup> Murphy Reply Declaration, p. 46.

<sup>37</sup> Mr. Murphy's citation on this matter is in error. I did not find reference to this matter at ¶ 222 or footnote 804 in the *Input Order* (Tenth Report and Order) as is indicated in footnote 109 of Mr. Murphy's reply declaration. A quick review of the *Input Order* also did not reveal the statement elsewhere.

**G. Mr. Murphy and Plant Mix**

34. Mr. Murphy is also critical of the HAI model's assumptions with regard to plant mix, as reflected in the percentages of aerial, buried, and underground plant assumed in the network design.<sup>38</sup> Like structure sharing, plant mix is also a user-adjustable input in the HAI model. In my Reply Declaration I presented information on plant mix, which I have reproduced in Appendix 1 to this Declaration. It can be seen from the values in Appendix 1 that the Joint Applicants' default values for copper and fiber feeder plant assume a higher percentage of underground than is the case with the FCC SM default values. Other things equal, this will lead to higher cost estimates. If the Commission believes that the HAI default values should be changed, the default values associated with Joint Applicants' model can be easily changed. Appendix 1 shows the FCC SMPC input platform values that were utilized to generate the results shown in my Reply Declaration.

**H. Mr. Murphy and Fill Factors**

35. Mr. Murphy also takes issue with the HAI fill factors.<sup>39</sup> He indicates that network design principles require "two or more pairs be built to serve each subscriber

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<sup>38</sup> Murphy Reply Declaration, p. 49.

<sup>39</sup> Murphy Reply Declaration, p. 51.

location.”<sup>40</sup> Mr. Murphy states that “levels of spare capacity have not changed appreciably”<sup>41</sup> and thus bases his discussion of the appropriate level of fill on existing or embedded levels of fill in distribution plant. Forward-looking cost modeling does not assume that existing outside plant and the existing level of fill associated with existing outside plant is the appropriate starting point for efficient network design. While I disagree with Mr. Murphy’s perspective, as I discussed in my Reply Declaration, the HAI model provides user-adjustable cable sizing factors. Appendix 1 shows the HAI default cable sizing factors and those which I applied based on the FCC SMPC input platform. Some of the HAI cable sizing factors are higher than those utilized by the FCC SM and thus, *ceteris paribus*, will be expected to reduce cost estimates. However, Mr. Murphy or the Commission is free to respecify the default HAI fill values as I did to generate the alternative HAI model runs in my Reply Declaration.

36. As was discussed in my Reply Declaration, the use of cable sizing factors results in an actual or achieved level of fill which is lower than that implied by the cable sizing factor itself. The difference between the administrative level of fill that is implied by the cable sizing factor and the achieved fill results from the constraints imposed

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<sup>40</sup> Murphy Reply Declaration, p. 52.

<sup>41</sup> Murphy Reply Declaration, p. 52.

by available cable sizes. The HAI model output reports the achieved fill levels, which are consistently below the cable sizing factors. Attachment TRR-R1 contains the file “HAI\_Achieved\_Distribution\_Fill.xls” which shows that distribution fill achieved by the HAI model utilizing the FCC SMPC input platform is about 49%.<sup>42</sup> This level of achieved fill provides excess capacity to address the types of concerns raised by Mr. Murphy with regard to provisioning UNEs and customer churn.

**I. Mr. Murphy and Model Structure: Core Downtown Areas**

37. Mr. Murphy indicates that the “HM 5.3 fails to appropriately identify the core area (downtown) portion of urban wire centers and their unique loop provisioning requirements, and thus significantly understates the loop UNE cost estimates produced by the Model.”<sup>43</sup> Mr. Murphy indicates that the HAI’s high-rise test inappropriately counts the number of high-rise buildings in San Francisco.<sup>44</sup> Mr. Murphy also states that HAI’s modeling of underground feeder plant in core (downtown) areas “significantly reduces the loop UNE cost estimates in the core

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<sup>42</sup> As is explained in the worksheet, the information supporting the 49% is drawn from the file “HAI\_CA\_Pacific\_Bell\_FCC\_SM\_Direct\_2-5-03\_WC.xls” which was provided in Attachment TRR-3 of my Reply Declaration.

<sup>43</sup> Mr. Murphy’s Reply Declaration, pp. 25-26.

<sup>44</sup> Ibid, p. 30-31.

areas.”<sup>45</sup> In sum, Mr. Murphy indicates that with regard to core areas the HAI model includes a number of inappropriate assumptions or processes which lead to a *significant* understatement of costs. When asked about his use of the term “significant” with regard to the understatement of costs in core areas Mr. Murphy states that his use of the term indicates “that the impact of each error would understate costs in a noticeably or measurably large amount.”<sup>46</sup>

38. It is thus instructive to compare cost model output for the core urban areas on which Mr. Murphy bases his conclusions that the HAI “significantly understates the loop

|          | HAI with FCC SMPC Input Platform | FCC SM, FCC SMPC Input Platform | LoopCAT with FCC Fill, Cost of Capital, Depreciation |
|----------|----------------------------------|---------------------------------|--|
|          | Column 1                         | Column 2                        | Column 3   |
| SNFCCA01 | \$3.64                           | \$1.38                          | \$4.06   |
| SNFCCA04 | \$5.84                           | \$2.97                          | \$4.46   |
| SNFCCA05 | \$7.35                           | \$4.04                          | \$5.92   |
| SNFCCA06 | \$9.51                           | \$5.12                          | \$7.34   |
| SNFCCA12 | \$5.28                           |                                 | \$5.08   |
| SNFCCA13 | \$7.01                           | \$4.64                          | \$5.71   |
| SNFCCA14 | \$8.37                           | \$4.83                          | \$6.83   |
| SNFCCA17 | \$9.28                           | \$3.56                          | \$7.32   |
| SNFCCA21 | \$3.43                           |                                 | \$3.78   |
| SNFCCA64 | \$0.96                           | \$2.83                          | \$2.46   |

<sup>45</sup> Ibid, p. 32.

<sup>46</sup> Reply to TURN’s Data Request 4-2(B).

UNE cost estimates produced by the model.” In response to discovery SBC Pacific indicates that Mr. Murphy based his analysis on the following San Francisco wire centers: SNFCCA01, SNFCCA04, SNFCCA05, SNFCCA06, SNFCCA12, SNFCCA13, SNFCCA14, SNFCCA17, SNFCCA21, and SNFCCA64.<sup>47</sup> Table 1 compares the output of the HAI model with the FCC SM and LoopCAT for these wire centers.

39. It should be noted that the FCC SM does not contain a cost estimate for the SNFCCA12 or SNFCCA21 CLLI™ codes, but includes a wire center that is not contained in the HAI or LoopCAT models (SNFCCA19, which is omitted from Table 1). I will briefly recap the basis for the results shown in Table 1. In column 1 are HAI cost estimates developed in my Reply Declaration utilizing the FCC SMPC input platform. Column 2 is the output from the FCC SM which also utilizes the FCC SMPC input platform. Finally, Column 3 shows the output of the LoopCAT model with the FCC SM input values for fill factors, depreciation, and cost of capital. The information that is provided in Table 1 is reproduced from the file “Wire\_Center\_Reconciliation\_Cost\_Comparison\_Proprietary\_(2-5-03).xls” which was provided in Attachment TRR-3 of my Reply Declaration.
40. It can be seen in Table 1 that with one exception the HAI model generates cost

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<sup>47</sup> Response to TURN’s Data Request 4-6.

estimates that are considerably higher than the FCC SM. With one exception HAI values in Column 1 range between 1.3 and 2.65 times as great as the FCC SM values in Column 2. The exception to HAI's higher costs is wire center SNFCCA64, which contains a relatively small number of access lines (it is associated with the UCSF hospital).

| Table 2: San Francisco Core Area Comparison: Weighted Average Cost Per Line for the Wire Centers Analyzed by Mr. Murphy. |                                 |  |
|--|---------------------------------|--|
| HAI with FCC SMPC Input Platform   | FCC SM, FCC SMPC Input Platform | LoopCAT with FCC Fill, Cost of Capital, Depreciation |
| Column 1   | Column 2                        | Column 3   |
| \$5.90   | \$2.40                          | \$5.20   |

Table 2 shows the weighted average loop costs for all loops in the San Francisco core area wire centers shown in Table 1. It can be seen that the lower costs identified by the HAI model for SNFCCA64 do not significantly impact its tendency to produce higher weighted average cost estimates in this core area, with the weighted average produced by the HAI being 2.46 times the FCC SM.

41. It also can be seen from Tables 1 and 2 that the HAI model produces cost estimates in the San Francisco core area which are generally higher than the estimates produced by the LoopCAT model using the FCC SM input assumptions regarding depreciation, cost of capital, and fill factors. Modifying these assumptions of the LoopCAT model does not alter any of the engineering assumptions used by

LoopCAT to serve wire centers located in the core urban areas with respect to support structure, plant mix, cable routes, cable inventory, building identification, etc. It can be seen in Table 2 that HAI's estimate is about 13% higher than LoopCAT's.

42. Mr. Murphy's general and specific criticism with regard to HAI's ability to model costs in the core urban areas is unfounded. The results discussed above illustrate that the HAI model produces conservatively high estimates when compared to the FCC SM and even when compared to LoopCAT for the areas evaluated by Mr. Murphy.
43. When asked about the problem alleged by Mr. Murphy with regard to core areas and the HAI's modeling of the high-rise buildings alleged by Mr. Murphy, Joint Applicants responded as follows:

What Mr. Murphy apparently fails to recognize is that by conservatively underestimating the number of high-rise buildings in this fashion, HM 5.3 over-estimates the cost of outside plant required to serve customers. Customers located in a high-rise building are served by intra-building riser cables extending from the telephone company SAI located in the basement of the building to the individual customer locations within the building. Inasmuch as that cable is either provided by the building owner or is recovered by SBC-Pacific through tariffs separate from its loop tariffs, such cable should be excluded from the distribution cable costs calculated by the model.<sup>2</sup> But in those cases where the model does not identify a high-rise location, but instead groups customers with other nearby locations<sup>3</sup> in a cluster of greater extent than the buildings that actually contain the customers, the model instead treats them as if they are spread across the

wider area of the cluster within which they are located, and assumes they are served by SBC-Pacific horizontal distribution cables. Thus, in place of the relatively short riser cables required to serve typical high-rise buildings, the model instead provisions more extensive distribution cables.

Footnotes

<sup>2</sup> As an additional conservative measure, the model currently includes the cost of riser cable required to serve the customers located in the high-rise buildings it identifies, but such cable can be excluded by zeroing out the riser cable cost inputs in the model.

<sup>3</sup> Which, of course, may themselves be high-rise buildings that the model has not identified as high-rises.

(Response to TURN's Data Request 3-3, emphasis and footnotes from the original response.)

44. Given the results shown above in Tables 1 and 2, I believe that Joint Applicants' claim of the conservative nature of their assumptions with regard to high-rise buildings is a reasonable one. I do not believe Mr. Murphy has provided any evidence that the HAI model "significantly" understates loop costs in core downtown urban areas related to non-user-adjustable inputs in the HAI model.
45. While Mr. Murphy indicates that he has conducted no analysis other than that related to the San Francisco wire center discussed above,<sup>48</sup> SBC Pacific indicates, with reference to the Commission Decision 02-02-047, that "all of the wire centers in Zone 1 on Attachment A of that decision are highly likely to have an urban core

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<sup>48</sup> SBC Pacific Response to TURN's Data Request 4-6.

area.<sup>49</sup> To compare the core area of San Francisco with all Zone 1 wire centers is unreasonable. Many Zone 1 wire centers are associated with suburban areas and even a few rural areas are in Zone 1. As is discussed above, for the core areas on which Mr. Murphy bases his complaint, the HAI model produces results well in excess of the FCC SM. Furthermore, as I discussed in my Reply Declaration, with regard to Zone 1 areas, the HAI model using the FCC SMPC input platform produces cost estimates which are nearly *twice* those produced by the FCC SM. While I do not believe that comparison of the output of the HAI and LoopCAT is as meaningful as the comparison of the HAI and FCC SM, due to LoopCAT's underlying embedded cost orientation, it may be useful to recall also that with regard to Zone 1, the modified HAI model utilizing the FCC SMPC input platform produced cost estimates that are only 9% lower than the LoopCAT model which used FCC SM inputs for depreciation, cost of capital, and fill. I believe that this difference is the reflection of LoopCAT's overall embedded cost orientation, not the result of HAI problems with core urban areas.

**J. Summary of Mr. Murphy on User-Adjustable Inputs and Model Structure**

46. As I have discussed above in this declaration, Mr. Murphy's criticism of the HAI model can be divided into (1) criticism of input values for user-adjustable inputs

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<sup>49</sup> Ibid.

selected by Joint Applicants and (2) criticism of the model's structure associated with assumptions that are not reflected in the user-adjustable inputs. As I have also discussed above and in my Reply Declaration, the ability to modify user-adjustable inputs is a strength, not a weakness, of the HAI model. Thus, Mr. Murphy's criticism of the HAI model leveled at the user-adjustable input values is specious. With regard to the engineering assumptions related to core urban areas and high-rise building, which make up the bulk of Mr. Murphy's non-user-adjustable-input criticism of the HAI model, Mr. Murphy's complaints ring hollow.

**K. Mr. Murphy and Consensus Costing Principle No. 6**

47. Mr. Murphy and other SBC Pacific witnesses have pointed to the Commission's Consensus Costing Principle No. 6 (CCP-6), which specifies that "TSLRIC analysis should be based on the existing or planned location of switching and outside plant facilities using the least-cost, most efficient technology."<sup>50</sup> CCP-6 is contradicted, in part, by the FCC's rules as codified in §51.505(b)(1) of the Code of Federal Regulations, which while otherwise similar in spirit to CCP-6, specifies that only existing locations of incumbent LEC's wire centers may be considered, not the outside plant facilities also specified in CCP-6. Counsel has advised me that given

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<sup>50</sup> "Consensus Costing Principles/Basic Network Functions; OANAD Cost Methodology Workshops." August 23, 1995, p. 4.

recent U.S. Supreme Court rulings, the FCC has the authority to impose its TELRIC methodology on the states and that the TELRIC methodology itself has withstood scrutiny at the Supreme Court level. It is useful to recall that the selection of the fixed wire center approach represents a compromise and produces higher cost estimates than if network optimization were to be allowed. Under the network optimization approach, wire center locations are not fixed and the cost model decides the best location for the switch, which is not necessarily its current location.

48. Mr. Murphy also indicates that the HAI model is inconsistent with CCP-6 based on the provision which requires that technology utilized in a forward-looking cost study to be “in use, at least partially, today.” Mr. Murphy points to the HAI model’s use of GR-303 Integrated Digital Loop Carrier (IDLC) as contrary to CCP-6 and to TELRIC as this “technology is not used today, even partially, to provision unbundled loops in a multi-carrier environment.”<sup>51</sup> While Mr. Murphy’s statement is apparently true with regard to the multi-carrier environment, his interpretation of the Commission’s CCP-6 with regard to the term “partially” is rather confining. With regard to IDLC, according to SBC Pacific a sizeable number of UNE-P arrangements, **(begin proprietary) xx% (end proprietary)**, are currently provided

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<sup>51</sup> Murphy Reply Declaration, p. 5.

over IDLC facilities.<sup>52</sup> Thus, it would appear that IDLC technology is at least partially in use today to provision UNEs. However, information provided by SBC Pacific also indicates that IDLC is not currently in use by SBC Pacific to provision stand-alone loops. Within the context of the cost modeling question, adjusting the HAI model to account for non-IDLC provisioning of UNE loops in a multi-carrier environment appears to be a relatively simple process. During the December 4, 2003 cost modeling workshop, Joint Applicants indicated that adjusting DLC investment would be an appropriate mechanism to handle the provisioning of DS0 loops in an IDLC environment.<sup>53</sup> In the alternative run of the HAI model which I provided with my Reply Declaration, I increased the HAI DLC common equipment investment to the levels associated with the FCC SM, which represented a substantial increase in these input values from the HAI default values.

**L. Mr. Murphy and the FCC SM**

49. Mr. Murphy indicates that the FCC's Synthesis Model (FCC SM) is ill-equipped to estimate the costs of many of the UNEs at issue in this proceeding. He indicates that the FCC has stated that the FCC SM produces costs which are "averaged at the

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<sup>52</sup> Supplemental Response to Joint Applicant's Data Request No. 1122.

<sup>53</sup> Workshop transcript, December 4, 2002, pp. 387-389.

statewide level.”<sup>54</sup> With this comment Mr. Murphy confuses the application of FCC SM cost estimates with the actual operation of the FCC SM. Mr. Murphy takes the FCC’s statement on averages out of context. The FCC statement on this issue is as follows: “The forward-looking costs estimated by the cost model are averaged at the statewide level.”<sup>55</sup> Thus, it is true that the FCC utilized averages at the statewide level; however, the FCC SM produces estimates at either the wire center level or based on density zones, as specified by the user. Thus, the FCC SM provides a highly detailed view of costs, focusing on wire centers if necessary.

50. Mr. Murphy also indicates that the FCC SM is not suitable for producing switching cost estimates.<sup>56</sup> He quotes from an FCC Order to illustrate his point: “switching costs are less significant than they would be in, for example, a cost model to determine unbundled network element switching and transport costs.”<sup>57</sup> However, examining the context of the quote utilized by Mr. Murphy to cast doubt on the HAI model’s ability to produce switching cost estimates shows that his interpretation of the FCC’s discussion is entirely inappropriate:

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<sup>54</sup> Murphy reply declaration, page 16.

<sup>55</sup> Ninth Report and Order, ¶ 10.

<sup>56</sup> Murphy Reply Declaration, p. 16.

<sup>57</sup> Mr. Murphy’s emphasis in his quote from ¶75 of the Fifth Report and Order (FCC 98-279), see footnote 58 for complete citation.

We conclude that the federal universal service mechanism should incorporate, with certain modifications, the HAI 5.0 switching and interoffice facilities module. We find that HAI's module satisfies the relevant criteria set forth in the *Universal Service Order* and would be simpler to implement than BCPM's module. In our evaluation of the switching modules in this proceeding, we note that, for universal service purposes, where cost differences caused by differing loop lengths are the most significant cost factor, switching costs are less significant than they would be in, for example, a cost model to determine unbundled network element switching and transport costs.<sup>58</sup>

Mr. Murphy's interpretation of the FCC's commentary regarding the relative significance of loop length and switching costs is that the FCC concluded that the HAI model understates switching costs. However, when the FCC quote is viewed in context, what is clear is that the FCC has adopted, with modification, the HAI switching and interoffice facilities module. Mr. Murphy construes this paragraph to indicate that the FCC SM is incapable of estimating switching costs, however, the FCC makes only a relative comparison as to the magnitude of the cost drivers associated with the universal service issue. As the FCC appropriately notes, loop length is the more significant factor in driving costs associated with universal service funding. The FCC also appropriately notes that, within the context of cost modeling for UNE pricing, a study directed at switching and transport alone would result in switching taking on a relatively more significant role in the overall cost

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<sup>58</sup> *In the Matter of Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High-Cost Support for Non-Rural LECs*. Fifth Report and Order, FCC 98-279, October 28, 1998. ¶75, citations omitted.

estimate.

51. While Mr. Murphy alleges that the FCC SM is ill-equipped to estimate the costs of many of the UNEs under consideration in this proceeding,<sup>59</sup> he also indicates that the input values associated with the FCC SM are inappropriate for determining UNE prices.<sup>60</sup> Mr. Murphy indicates that “the FCC input values are neither state nor company specific. Inputs for a TELRIC UNE cost model/study should be state or company specific.”<sup>61</sup> Mr. Murphy points to comments made by the FCC in the *Input Order*:

For universal service purposes, we find that using nationwide averages is appropriate. The Commission has not considered what type of input values, company-specific or nationwide, nor what specific input values, would be appropriate for any other purposes. The federal cost model was developed for the purpose of determining federal universal service support, and it may not be appropriate to use nationwide values for other purposes, such as determining prices for unbundled network elements. We caution parties from making any claims in other proceedings based upon the input values we adopt in this Order.<sup>62</sup>

The FCC also noted in that same Order:

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<sup>59</sup> Murphy Reply Declaration, p. 16.

<sup>60</sup> Murphy Reply Declaration, p. 46.

<sup>61</sup> Response to TURN’s Data Request 4-1.

<sup>62</sup> *In the Matter of Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*. CC Docket 96-45, 97-160, Tenth Report and Order, November 2, 1999, ¶ 32.

For purposes of determining federal universal service support amounts, however, we believe that nationwide default values generally are more appropriate than company-specific values. Under the new federal universal service support mechanism, support is based on the estimated costs that an efficient carrier would incur to provide the supported services, rather than on the specific carrier's book costs.<sup>63</sup>

This statement illustrates the similarity between the methodology associated with the universal service funding question and the UNE pricing question, i.e., the estimated costs of an efficient carrier are in question. Furthermore, when considering UNE prices the FCC has presumed that the nationwide input values associated with the FCC SM are appropriate for determining TELRIC, unless there is a state-specific showing otherwise:

In addition, commenters have pointed out that Massachusetts used substantially lower fill factors in calculating its UNE-loop rates than this Commission has used in its USF cost model. For copper distribution cable, which affects loop rates, Verizon used a fill factor of 40 percent for metro, urban, and suburban zones. In the *SWBT Kansas/Oklahoma Order*, the Commission found that a fill factor of 30 percent for distribution cable was too low because it assumed that too large a percentage of capacity would be idle for an indefinite time, contrary to TELRIC's presumption of an efficient network. The Commission noted that it adopted fill factors ranging from 50 to 75 percent for the USF cost model, that the Kansas Commission adopted a 53 percent distribution cable fill factor, and that the New York Commission adopted a 50 percent distribution cable fill factor. We question whether the low fill factor used in Massachusetts is appropriate without a state-specific justification.<sup>64</sup>

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<sup>63</sup> Ibid, ¶ 31.

<sup>64</sup> *In the Matter of Application of Verizon New England Inc., Bell Atlantic*

(continued...)

Thus, the similarity in the methodology between the “FLEC” (forward-looking economic cost) associated with universal service funding and TELRIC allows input values associated with the FCC SM to be meaningfully applied in TELRIC studies. As I noted in my Reply Declaration, I applied company-specific cable costs as well as FCC SM input values to analyze the performance of the HAI model. The FCC SM and its input value platform provide a reasonable means to benchmark the performance of other cost models which purport to be based on TELRIC principles.

52. The FCC has made statements in various rulings addressing the use of the FCC SM and its input platform for assessing the reasonableness of UNE rates. While the FCC SM was not created specifically for calculating TELRIC, it is based on the same forward-looking cost methodology that should be applied in a TELRIC study. Thus, the FCC has addressed the ability of FCC SM users to examine the cost estimates contained within the SM which are applicable to TELRIC analysis. The FCC’s initial position on the application of the FCC SM and its input platform by state commissions for pricing UNEs was as follows:

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<sup>64</sup>(...continued)

*Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions) and Verizon Global Networks Inc., for Authorization to Provide In-Region, InterLATA Services in Massachusetts.* CC Docket No. 01-9, FCC No. 01-130. Memorandum Report and Order, April 16, 2001, ¶39.

[T]he federal cost model was developed for the purpose of determining federal universal service support, and that it may not be appropriate to use nationwide values for other purposes, such as determining prices for unbundled network elements. The Commission has not considered the appropriateness of this model for any other purposes, and we have cautioned parties from making any claims in other proceedings based upon the input values adopted in the *Inputs Order*.<sup>65</sup>

In a footnote to the first sentence in the above paragraph, the FCC states:

State commissions, for example, *may* find that it is not appropriate to use nationwide values in determining state universal service support or prices for unbundled network elements and *may* choose instead to use statewide or company-specific values.<sup>66</sup>

Thus, the FCC indicated that state commissions could use its cost model and its input values for determining UNE prices. The reservations expressed by the FCC address only whether nationwide or state or company-specific input values might be applied. There is no indication by the FCC that it thought the model itself was inappropriate for use by a state or that the input values could not be adopted by a state for TELRIC purposes. In fact, the quoted footnote suggests that the FCC

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<sup>65</sup> *In the Matter of Federal-State Joint Board on Universal Service*. CC Docket 96-45. Ninth Report & Order and Eighteenth Order on Consideration. FCC Order 99-306, released November 2, 1999, ¶41, footnotes omitted. A similar statement was contained in *In the Matter of Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*. CC Docket 96-45, 97-160, Tenth Report and Order, November 2, 1999, ¶ 32.

<sup>66</sup> Footnote 125, Ninth Report & Order and Eighteenth Order on Consideration. FCC Order 99-306, released November 2, 1999, ¶41, emphasis added.

anticipated that states would wish to use the model and its input values and the FCC was suggesting a way for states to use it with or without state- or company-specific input values.

53. Furthermore, the FCC itself has used the FCC SM with nationwide input values to assess the reasonableness of UNE prices. For example, when considering SBC's 271 application in Kansas and Oklahoma:

In taking a weighted average of loop rates in Oklahoma and Texas, we find that Oklahoma's rates are roughly one-third higher than those in Texas. This difference is substantial, but by itself does not indicate that Oklahoma's rates are not at TELRIC-based levels. We disagree with commenters who argue otherwise, because as the Department of Justice notes, "[s]uch differences may arise either from differences in costs between states, or from different judgement—both of which are reasonable—on rate making issues that are not susceptible to precise determination.

As we note above, however, we cannot rely on the judgment of the ALJ with respect to loop costs. Consequently, we must either conclude that the rate differential is based on cost, or that Oklahoma's recurring rates are not TELRIC-based. Our USF cost model provides a reasonable basis for comparing cost differences between states. We have previously noted that while the USF cost model should not be relied upon to set rates for UNEs, it accurately reflects the relative cost difference among states. Using weighted average of wire-center loop costs, the USF cost model indicates that loop costs in SWBT's Oklahoma Study area are roughly 23 percent higher than loop costs in its Texas study area. We therefore attribute this portion of the differential, roughly two-thirds of it, to differences in costs.<sup>67</sup>

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<sup>67</sup> *In the Matter of Joint Application by SBC Communications Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc.*  
(continued...)

Thus, the FCC utilized the FCC SM with default nationwide input values to determine that loop costs in Oklahoma were 23 percent higher than loop costs in Texas.

54. It can be seen in the cited paragraph from the Kansas and Oklahoma §271 proceeding (above) that the FCC alludes to a position that its cost model should not be used to set rates for UNEs. However, the citation for the sentence in question is none other than paragraph 41 of FCC Order 99-306 (i.e., the same paragraph from the Ninth Report and Order cited previously, above). Thus, the FCC's apparent change of position on the matter is not supported by the FCC's words (as stated in paragraph 41 of FCC Order 99-306) nor is it supported by the FCC's actions, i.e., the FCC has utilized the FCC SM with its default input values to evaluate whether SBC Oklahoma's and other RBOC's UNE rates are consistent with TELRIC principles.
55. Furthermore, as I mentioned in my Reply Declaration, in its recent Order approving SBC Pacific's interLATA bid in California, the FCC relied on output from the FCC

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<sup>67</sup>(...continued)

*d/b/a Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma.* Memorandum Opinion and Order. FCC Order No. 01-29, released January 22, 2001. ¶ 83 & 84, footnotes omitted.

SM to address the reasonableness of UNE rates. Once again, this analysis was conducted with the benefit of the default nationwide input values.

**V. Joint Applicants and Ms. Bash's Claims**

56. Joint Applicants witnesses Mr. Donovan, Mr. Pitkin, and Mr. Turner (hereinafter DPT) discuss SBC Pacific witness Ms. Bash's contention regarding the relationship between fill factors and maintenance expenses. DPT arrive at the same conclusions that I presented in my Reply Declaration, i.e., that Ms. Bash's claims are unsubstantiated and that the relationship that she claims is not demonstrated by the data she provides. However, it is worthwhile noting that SBC Pacific has provided TURN and Joint Applicants different stories regarding the origin of the information which supports Ms. Bash's CMB-6 (CMB-6 is the attachment in which she alleges the relationship between fill factors and maintenance expenses which shows higher fills yielding higher maintenance expenses). As I discussed in my Reply Declaration, TURN requested information on maintenance expenses for outside plant identified by CLLI™ code. The objective in making this request was to examine maintenance expenses associated with outside plant in their naturally occurring setting (i.e., with the associated wire centers where multiple binder groups of various fills would be present). I was surprised to find the information that SBC Pacific supplied regarding maintenance expenses by CLLI™ code was a

much larger dollar value than the information shown in CMB-6 (by approximately \$100 million). SBC Pacific eventually supplied information which explained the difference between the information supplied to TURN and the information contained in CMB-6. SBC Pacific told TURN that the difference is the result of CMB-6 containing information only on distribution cable, while TURN was given information on distribution and feeder.<sup>68</sup> As I discussed in my Reply Declaration, there is no reason I can see to exclude information on feeder, especially in light of comments made by Ms. Bash in which she indicates that feeder and distribution both suffer from the same problem, i.e., higher fill leads to higher maintenance expenses. My review of the Reply Declaration of DPT has identified even more inconsistency with the SBC Pacific story as to the origin of the data which support CMB-6. DPT point out that in response to Joint Applicants' data request DR 567, SBC Pacific asserts that the data in CMB-6 "involved Living Units served under the SAC concept."<sup>69</sup> SAC abbreviates "serving area concept," which reflects an approach to local exchange network design. As is pointed out by DPT, Ms. Bash indicated during her deposition that at least 50 percent of SBC Pacific loop plant is served by the

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<sup>68</sup> Response to TURN's Data Request 3-2(b).

<sup>69</sup> SBC Pacific response to Joint Applicants data request DR 567.

SAC, which means that some portion, possibly a large portion, is not.<sup>70</sup> Ms. Bash indicated that her understanding of SAC included both feeder and distribution cable.<sup>71</sup> Thus by this measure, Ms. Bash's CMB-6 excludes a significant portion of feeder and distribution plant, i.e., that not served under the SAC. Moreover, when this information is combined with the information provided to TURN which states that only distribution cable is covered in CMB-6, the reliability of CMB-6 is thrown even further into doubt. What is clear regarding CMB-6 is that it is based on a highly selective sample of outside plant, one that entirely excludes the feeder portion of the network and apparently also excludes all loops which are provided through non-SAC arrangements. In conclusion on this point, the Reply Declaration of DPT provides additional evidence that Ms. Bash's claims regarding fill factors and maintenance expenses are dead wrong.

## **VI. Fill Factors and Price Squeeze Potential**

57. In my Reply Declaration I pointed out that SBC Pacific's split methodology for estimating loop costs for retail and wholesale services, which prescribes high fill factors for retail price floor (TSLRIC) studies and low fill factors for TELRIC studies could result in a price squeeze. This statement was based on the premise that

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<sup>70</sup> Bash Deposition, p. 124. Ms. Bash did not know if the number exceeded 80 percent.

<sup>71</sup> Bash Deposition, page 125.

the increased UNE prices, especially the increase UNE loop prices which are proposed by SBC Pacific would not result in corresponding rate increases for retail services. As is pointed out in the Joint Applicants' Reply Comments, it is possible that with SBC Pacific's interpretation of the Commission's rules with regard to price floors, SBC Pacific could proceed to argue for large rate increases for retail services, such as basic local exchange service, based on the Commission's approval of SBC Pacific's higher proposed UNE prices. While such a scenario would likely decrease the possibility of a price squeeze, it would be a disastrous outcome. Changes in local service rates should not be allowed to come in through the back door as is possible given SBC Pacific's interpretation of the Commission's price floor rules.

## **VII. Mr. McNeill and Ultimate Sizing**

58. Mr. McNeill is critical of the HAI as it does not follow "ultimate sizing" guidelines. Mr. McNeill indicates that SBC Pacific's current standards recommend "2 pairs per *ultimate* living unit."<sup>72</sup> The basic question raised by Mr. McNeill's criticism is whether ultimate sizing guidelines are appropriately associated with TELRIC studies. I believe that the answer is no. The FCC found that "ultimate demand" was

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<sup>72</sup> McNeill Reply Declaration, ¶18, emphasis in the original.

not consistent with forward-looking economic costs associated with universal service funding.

We find unpersuasive GTE's assertion that the input values for distribution fill factors should reflect ultimate demand. In concluding that the fill factors should reflect current demand, we recognized that correctly forecasting ultimate demand is a speculative exercise, especially because of rapid technological advances in telecommunications. For example, we note that ultimate demand decreases substantially when computer modem users switch from dedicated lines serving analog modems to digital subscriber lines where one pair of copper wire provides the same function as a voice line and a separate dedicated line. Given this uncertainty, we find that basing the fill factors on current demand rather than ultimate demand is more reasonable because it is less likely to result in excess capacity, which would increase the model's cost estimates to levels higher than an efficient firm's costs. . .<sup>73</sup>

While the FCC's position stated above was directed at cost modeling associated with universal service, the FCC maintained this position when considering UNE prices within the context of a §271 proceedings in Massachusetts and Kansas and Oklahoma, as evidenced by the quotes from those orders which were provided earlier in this Rebuttal Declaration.

59. Mr. McNeill also indicates that changes in lifestyles, such as children leaving home, individuals desiring to work at home, or changing economic conditions are examples of the type of volatility and uncertainty which make ultimate sizing a necessity.

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<sup>73</sup> *In the Matter of Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECs.* CC Docket 96-45, 97-160, Tenth Report and Order, November 2, 1999, ¶ 200.

However, Mr. McNeill is not critical of the SBC Pacific LoopCAT model for ignoring demand information which is at SBC Pacific's disposal that might be utilized to better match the deployment of distribution plant with demand conditions. As I noted in my Reply Declaration, some SBC Pacific wire centers sell virtually no second lines. Other wire centers sell many second lines.<sup>74</sup>

60. Finally, Mr. McNeill's criticism of the HAI model's approach to cable sizing as applied to distribution cable ignores the difference between cable sizing factors and achieved fill levels. Achieved fill levels that are lower than cable sizing factors result due to the fact that cable sizes are lumpy and will not perfectly match the needs for current demand. For example, as I discussed earlier, the achieved fill associated with the HAI model output which utilizes the FCC SMPC input platform (including distribution cable sizing factors which range from 50 to 75 percent) results in an achieved fill factor of about 49%.

### **VIII. Mr. Vanston: Competition and Depreciation Lives**

61. Mr. Vanston indicates that the most important factor necessitating the abandonment of FCC depreciation lives is competition.<sup>75</sup> He indicates that CLECs serve about

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<sup>74</sup> See "CA-Res-Prim-Adl-LinesByBand.xls" which was included with SBC Pacific's October 18, 2002 filing.

<sup>75</sup> Vanston Reply Declaration, p. 7.

10% of access lines nationwide and that ILECs are losing millions of access lines.

Mr. Vanston's analysis ignores California-specific information. As I discussed in my reply declaration, the progress of local exchange competition in California has been quite modest. Additionally, Mr. Vanston's comments on the status of local exchange competition nationwide also ignore the critical distinction between facilities-based competition and UNE- and resale-based competition. The difference between these alternative paths has a significant impact on his conclusions. He indicates that the increasing competition will "strand switch and circuit line cards, as well as cable pairs, translating into a major decrease in the economic value of ILEC assets, which is not accounted for in the FCC lives."<sup>76</sup>

With this statement, Mr. Vanston fails to recognize the distinction between facilities-based and resale- and UNE-based competition. It is possible that facilities-based competition could lead to the stranding of equipment to which Mr. Vanston refers. However, UNE and resale competition does not have the same impact, as the ILEC facilities continue to be used by the alternative service provider, and the ILEC continues to recover revenues associated with the provision of UNEs and resold services.

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<sup>76</sup> Vanston Reply Declaration, p. 7.

62. According to data provided by the FCC, nationwide statistics do indicate that over 10% of access lines are served by CLECs. However, only about 3.2% of access lines are CLEC owned, indicating that facilities-based competition has made very limited progress.<sup>77</sup> As I discussed in my Reply Declaration, California leads the nation in the number of CLEC-owned lines, but this translates into a 3.6% facilities-based market share in California, slightly above the national average. Thus, while Mr. Vanston presents no information regarding the status of competition in California to support his claim, California-specific information indicates that actual competitive forces are not well developed in the state.
63. Mr. Vanston indicates that the FCC's 1999 Report and Order<sup>78</sup> addressing depreciation is "largely irrelevant" to the case at hand.<sup>79</sup> I would disagree with Mr. Vanston's assessment. The FCC was aware of, and expressed concerns over, the

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<sup>77</sup> "Local Telephone Competition: Status as of June 30, 2002." Industry Analysis and Technology Division, Wireline Competition Bureau, *Federal Communications Commission*. December 2002. Tables 1 and 3.  
[http://www.fcc.gov/Bureaus/Common\\_Carrier/Reports/FCC-State\\_Link/IAD/lcom1202.pdf](http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/lcom1202.pdf)

<sup>78</sup> *In the Matter of 1998 Biennial Regulatory Review --Review of Depreciation Requirements for Incumbent Local Exchange Carriers, United States Telephone Association's Petition for Forbearance from Depreciation Regulation of Price Cap Local Exchange Carriers*. Report and Order in CC Docket No. 98-137, Memorandum Opinion and Order in ASD 98-91. FCC 99-397 December 30, 1999. Hereinafter, *Depreciation Order*.

<sup>79</sup> Vanston Reply Declaration, p. 10.

inter-related impact of depreciation rates. The overlapping areas that were of concern to the FCC included price cap regulated services, universal service funding, and UNE and interconnection rates. The FCC was especially concerned about the impact of unfettered ILEC depreciation practices on competition:

The harmful impact that increased (depreciation) charges could have on competition is also substantial. State regulatory commissions have set rates for interconnection and UNEs, and in many instances, have based the rates on Commission-prescribed depreciation factors. Incumbent LECs, acting as wholesale providers of critical facilities to their competitors, could independently establish depreciation rates that could result in unreasonably high interconnection and UNE rates, which competitors would be compelled to pay in order to provide competing local exchange service.<sup>80</sup>

The FCC went on to state that its maintenance of realistic ranges of depreciable life and salvage factors “can be relied upon by federal and state regulatory commissions for determining the appropriate depreciation factors to use in establishing high cost support and interconnection and UNE prices.”<sup>81</sup> It should also be noted that the FCC has utilized the default depreciation values contained in the FCC SM when evaluating UNE rates in Section 271 proceedings. This indicates, contrary to Mr. Vanston’s assertion that the FCC’s 1999 rates are out-of-date, that the FCC believes that the depreciation ranges it approved in 1999 continue to be appropriate.

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<sup>80</sup> *Depreciation Order*, ¶ 28.

<sup>81</sup> *Depreciation Order*, ¶ 34.

64. In my reply declaration I propose that the Commission adopt the depreciation lives and salvage values which are utilized as the default values in the FCC SM. These values fall within the FCC's prescribed ranges and provide a reasonable basis for developing UNE rates in California. As I noted in my Reply Declaration, Mr. Vanston's views with regard to competition and technology deployment are highly speculative and are not based on an analysis of conditions in California. Mr. Vanston's recommendations should be rejected by the Commission.

## **IX. Conclusion**

65. SBC Pacific's cost models are not TELRIC compliant. SBC Pacific's models, as they are not integrated, make auditing their results extremely difficult and open the possibility of double recovery. As I have discussed above, the criticism leveled at the HAI model by SBC Pacific does not properly distinguish between disputes associated with user-adjustable input values and with the model's structure. With regard to user-adjustable inputs, these values can be easily changed. However, some of the user-adjustable inputs criticized by SBC Pacific have little impact on cost estimates. As I discussed above, with regard to the block cable user-adjustable input, addressing SBC Pacific's concern increases weighted average loop costs by 4/10 of a cent. With regard to the HAI model's structure, SBC Pacific provides extensive criticism of the HAI model's capabilities with regard to "core urban"

areas. However, my analysis shows that the HAI model estimates costs in the core urban areas which Mr. Murphy analyzed which are about 2.5 times higher than the FCC SM and 13% higher than the LoopCAT model. My analysis of the criticism of the HAI model provided by SBC Pacific in its reply declarations does not lead me to alter my conclusions that the HAI model, when run with an appropriate set of input values, provides TELRIC estimates for local loops which are conservatively high when compared to the output of the FCC SM.

66. I believe that the use of the FCC SMPC input platform as I discussed in my Reply Declaration is an entirely reasonable approach to the cost modeling question before the Commission. Furthermore, if the Commission determines that other state-specific values beyond the cost of capital and cable prices are appropriate, the HAI model allows those values to be utilized in a convenient fashion. SBC Pacific's insistence on the use of embedded cost methodology associated with its cost models should be rejected by the Commission.
67. This concludes my Rebuttal Declaration.

**Appendix 1: Comparison of FCC SM and HAI Input Values**

| <b>Module/Table Scenario Input</b> |                                  | <b>FCC SM<br/>Default<br/>Value</b> | <b>HAI<br/>Default<br/>Value</b> |
|------------------------------------|----------------------------------|-------------------------------------|----------------------------------|
| Distribution                       | Distribution Cable Fill - 0      | 0.5                                 | 0.75                             |
| Distribution                       | Distribution Cable Fill - 5      | 0.55                                | 0.75                             |
| Distribution                       | Distribution Cable Fill - 100    | 0.55                                | 0.75                             |
| Distribution                       | Distribution Cable Fill - 200    | 0.6                                 | 0.75                             |
| Distribution                       | Distribution Cable Fill - 650    | 0.7                                 | 0.75                             |
| Distribution                       | Distribution Cable Fill - 850    | 0.75                                | 0.75                             |
| Distribution                       | Distribution Cable Fill - 2550   | 0.75                                | 0.75                             |
| Distribution                       | Distribution Cable Fill - 5000   | 0.75                                | 0.75                             |
| Distribution                       | Distribution Cable Fill - 10000  | 0.75                                | 0.75                             |
| Distribution                       | Buried Fraction - 0              | 0.6                                 | 0.4                              |
| Distribution                       | Buried Fraction - 5              | 0.62                                | 0.4                              |
| Distribution                       | Buried Fraction - 100            | 0.68                                | 0.4                              |
| Distribution                       | Buried Fraction - 200            | 0.66                                | 0.4                              |
| Distribution                       | Buried Fraction - 650            | 0.62                                | 0.4                              |
| Distribution                       | Buried Fraction - 850            | 0.5                                 | 0.4                              |
| Distribution                       | Buried Fraction - 2550           | 0.3                                 | 0.35                             |
| Distribution                       | Buried Fraction - 5000           | 0.1                                 | 0.35                             |
| Distribution                       | Buried Fraction - 10000          | 0                                   | 0.15                             |
| Distribution                       | Aerial Cable Fraction - 0        | 0.4                                 | 0.6                              |
| Distribution                       | Aerial Cable Fraction - 5        | 0.37                                | 0.6                              |
| Distribution                       | Aerial Cable Fraction - 100      | 0.3                                 | 0.6                              |
| Distribution                       | Aerial Cable Fraction - 200      | 0.3                                 | 0.6                              |
| Distribution                       | Aerial Cable Fraction - 650      | 0.3                                 | 0.6                              |
| Distribution                       | Aerial Cable Fraction - 850      | 0.3                                 | 0.6                              |
| Distribution                       | Aerial Cable Fraction - 2550     | 0.3                                 | 0.6                              |
| Distribution                       | Aerial Cable Fraction - 5000     | 0.3                                 | 0.5                              |
| Distribution                       | Aerial Cable Fraction - 10000    | 0.1                                 | 0.5                              |
| Distribution                       | Underground Cable Fraction - 0   | 0.0                                 | 0.0                              |
| Distribution                       | Underground Cable Fraction - 5   | 0.01                                | 0.0                              |
| Distribution                       | Underground Cable Fraction - 100 | 0.02                                | 0.0                              |
| Distribution                       | Underground Cable Fraction - 200 | 0.04                                | 0.0                              |
| Distribution                       | Underground Cable Fraction - 650 | 0.08                                | 0.0                              |

| <b>Module/Table Scenario Input</b> |   | <b>FCC SM<br/>Default<br/>Value</b> | <b>HAI<br/>Default<br/>Value</b> |
|------------------------------------|---|-------------------------------------|----------------------------------|
| Distribution                       | Underground Cable Fraction - 850            | 0.2                                 | 0.0                              |
| Distribution                       | Underground Cable Fraction - 2550           | 0.4                                 | 0.05                             |
| Distribution                       | Underground Cable Fraction - 5000           | 0.6                                 | 0.15                             |
| Distribution                       | Underground Cable Fraction - 10000          | 0.9                                 | 0.35                             |
| Distribution                       | Buried Drop Sharing Fraction - 0            | 1                                   | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 5            | 1                                   | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 100          | 0.85                                | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 200          | 0.65                                | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 650          | 0.65                                | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 850          | 0.65                                | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 2550         | 0.55                                | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 5000         | 0.55                                | 0.5                              |
| Distribution                       | Buried Drop Sharing Fraction - 10000        | 0.55                                | 0.5                              |
| Distribution                       | Buried Drop Fraction - 0                    | 0.6                                 | 0.4                              |
| Distribution                       | Buried Drop Fraction - 5                    | 0.62                                | 0.4                              |
| Distribution                       | Buried Drop Fraction - 100                  | 0.68                                | 0.4                              |
| Distribution                       | Buried Drop Fraction - 200                  | 0.66                                | 0.4                              |
| Distribution                       | Buried Drop Fraction - 650                  | 0.62                                | 0.4                              |
| Distribution                       | Buried Drop Fraction - 850                  | 0.5                                 | 0.4                              |
| Distribution                       | Buried Drop Fraction - 2550                 | 0.3                                 | 0.35                             |
| Distribution                       | Buried Drop Fraction - 5000                 | 0.1                                 | 0.35                             |
| Distribution                       | Buried Drop Fraction - 10000                | 0                                   | 0.15                             |
| Distribution                       | Common equipment investment, installed - 1  | 19881                               | 15000                            |
| Distribution                       | Common equipment investment, installed - 2  | 23848                               | 18300                            |
| Distribution                       | Common equipment investment, installed - 3  | 33944.08                            | 27700                            |
| Distribution                       | Common equipment investment, installed - 4  | 97443.38                            | 70000                            |
| Distribution                       | Common equipment investment, installed - 5  | 107224.92                           | 88500                            |
| Distribution                       | Common equipment investment, installed - 6  | 152617.43                           | 107000                           |
| Distribution                       | Common equipment investment, installed - 7  | 232705.92                           | 163150                           |
| Distribution                       | Common equipment investment, installed - 8  | 262587.56                           | 184100                           |
| Distribution                       | Common equipment investment, installed - 9  | 283625.94                           | 198850                           |
| Distribution                       | Common equipment investment, installed - 10 | 357723.85                           | 250800                           |
| Distribution                       | Common equipment investment, installed - 11 | 386036.52                           | 270650                           |
| Distribution                       | Common equipment investment, installed - 12 | 415918.16                           | 291600                           |

| <b>Module/Table Scenario Input</b> |  | <b>FCC SM<br/>Default<br/>Value</b> | <b>HAI<br/>Default<br/>Value</b> |
|------------------------------------|--|-------------------------------------|----------------------------------|
| <b>Distribution</b>                | <b>Common equipment investment, installed - 13</b> | <b>454357.78</b>                    | <b>318550</b>                    |
| <b>Distribution</b>                | <b>Common equipment investment, installed - 14</b> | <b>482670.45</b>                    | <b>338400</b>                    |
| <b>Distribution</b>                | <b>Common equipment investment, installed - 15</b> | <b>503708.84</b>                    | <b>353150</b>                    |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 0</b>                      | <b>0.7</b>                          | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 5</b>                      | <b>0.775</b>                        | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 100</b>                    | <b>0.8</b>                          | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 200</b>                    | <b>0.825</b>                        | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 650</b>                    | <b>0.825</b>                        | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 850</b>                    | <b>0.825</b>                        | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 2550</b>                   | <b>0.825</b>                        | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 5000</b>                   | <b>0.825</b>                        | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Feeder Fill - 10000</b>                  | <b>0.825</b>                        | <b>0.8</b>                       |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 0</b>                  | <b>0.45</b>                         | <b>0.55</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 5</b>                  | <b>0.45</b>                         | <b>0.55</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 100</b>                | <b>0.45</b>                         | <b>0.55</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 200</b>                | <b>0.4</b>                          | <b>0.41</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 650</b>                | <b>0.3</b>                          | <b>0.23</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 850</b>                | <b>0.15</b>                         | <b>0.15</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 2550</b>               | <b>0.1</b>                          | <b>0.09</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 5000</b>               | <b>0.05</b>                         | <b>0.06</b>                      |
| <b>Feeder</b>                      | <b>Copper Aerial Fraction - 10000</b>              | <b>0.05</b>                         | <b>0</b>                         |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 0</b>                  | <b>0.5</b>                          | <b>0.4</b>                       |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 5</b>                  | <b>0.5</b>                          | <b>0.4</b>                       |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 100</b>                | <b>0.5</b>                          | <b>0.4</b>                       |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 200</b>                | <b>0.4</b>                          | <b>0.29</b>                      |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 650</b>                | <b>0.3</b>                          | <b>0.17</b>                      |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 850</b>                | <b>0.25</b>                         | <b>0.1</b>                       |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 2550</b>               | <b>0.15</b>                         | <b>0.06</b>                      |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 5000</b>               | <b>0.05</b>                         | <b>0.04</b>                      |
| <b>Feeder</b>                      | <b>Copper Buried Fraction - 10000</b>              | <b>0.0</b>                          | <b>0.0</b>                       |
| <b>Feeder</b>                      | <b>Copper Underground Fraction - 0</b>             | <b>0.05</b>                         | <b>0.05</b>                      |
| <b>Feeder</b>                      | <b>Copper Underground Fraction - 5</b>             | <b>0.05</b>                         | <b>0.05</b>                      |
| <b>Feeder</b>                      | <b>Copper Underground Fraction - 100</b>           | <b>0.05</b>                         | <b>0.05</b>                      |
| <b>Feeder</b>                      | <b>Copper Underground Fraction - 200</b>           | <b>0.2</b>                          | <b>0.3</b>                       |

| <b>Module/Table Scenario Input</b> |                                      | <b>FCC SM<br/>Default<br/>Value</b> | <b>HAI<br/>Default<br/>Value</b> |
|------------------------------------|--------------------------------------|-------------------------------------|----------------------------------|
| Feeder                             | Copper Underground Fraction - 650    | 0.4                                 | 0.6                              |
| Feeder                             | Copper Underground Fraction - 850    | 0.6                                 | 0.75                             |
| Feeder                             | Copper Underground Fraction - 2550   | 0.75                                | 0.85                             |
| Feeder                             | Copper Underground Fraction - 5000   | 0.9                                 | 0.9                              |
| Feeder                             | Copper Underground Fraction - 10000  | 0.95                                | 1                                |
| Feeder                             | Fiber Aerial Fraction - 0            | 0.45                                | 0.2                              |
| Feeder                             | Fiber Aerial Fraction - 5            | 0.45                                | 0.2                              |
| Feeder                             | Fiber Aerial Fraction - 100          | 0.45                                | 0.2                              |
| Feeder                             | Fiber Aerial Fraction - 200          | 0.4                                 | 0.15                             |
| Feeder                             | Fiber Aerial Fraction - 650          | 0.3                                 | 0.13                             |
| Feeder                             | Fiber Aerial Fraction - 850          | 0.15                                | 0.1                              |
| Feeder                             | Fiber Aerial Fraction - 2550         | 0.1                                 | 0.08                             |
| Feeder                             | Fiber Aerial Fraction - 5000         | 0.05                                | 0.05                             |
| Feeder                             | Fiber Aerial Fraction - 10000        | 0.05                                | 0                                |
| Feeder                             | Fiber Buried Fraction - 0            | 0.5                                 | 0.2                              |
| Feeder                             | Fiber Buried Fraction - 5            | 0.5                                 | 0.2                              |
| Feeder                             | Fiber Buried Fraction - 100          | 0.5                                 | 0.2                              |
| Feeder                             | Fiber Buried Fraction - 200          | 0.4                                 | 0.15                             |
| Feeder                             | Fiber Buried Fraction - 650          | 0.3                                 | 0.12                             |
| Feeder                             | Fiber Buried Fraction - 850          | 0.25                                | 0.1                              |
| Feeder                             | Fiber Buried Fraction - 2550         | 0.15                                | 0.07                             |
| Feeder                             | Fiber Buried Fraction - 5000         | 0.05                                | 0.05                             |
| Feeder                             | Fiber Buried Fraction - 10000        | 0.0                                 | 0.0                              |
| Feeder                             | Fiber Underground Fraction - 0       | 0.05                                | 0.6                              |
| Feeder                             | Fiber Underground Fraction - 5       | 0.05                                | 0.6                              |
| Feeder                             | Fiber Underground Fraction - 100     | 0.05                                | 0.6                              |
| Feeder                             | Fiber Underground Fraction - 200     | 0.2                                 | 0.7                              |
| Feeder                             | Fiber Underground Fraction - 650     | 0.4                                 | 0.75                             |
| Feeder                             | Fiber Underground Fraction - 850     | 0.6                                 | 0.8                              |
| Feeder                             | Fiber Underground Fraction - 2550    | 0.75                                | 0.85                             |
| Feeder                             | Fiber Underground Fraction - 5000    | 0.9                                 | 0.9                              |
| Feeder                             | Fiber Underground Fraction - 10000   | 0.95                                | 1                                |
| Feeder                             | Water table depth for dewatering, ft | 3                                   | 5                                |
| Expense                            | Cost of Debt                         | 0.088                               | 0.0482                           |

| <b>Module/Table</b> | <b>Scenario Input</b>                             | <b>FCC SM<br/>Default<br/>Value</b> | <b>HAI<br/>Default<br/>Value</b> |
|---------------------|---|-------------------------------------|----------------------------------|
| Expense             | Debt Fraction                                     | 0.442                               | 0.429                            |
| Expense             | Cost of Equity                                    | 0.1319                              | 0.0987                           |
| Expense             | Corporate Overhead Factor                         | 0                                   | 0.21                             |
| Expense             | Distribution Aerial Sharing Fraction - 0          | 0.5                                 | 0.5                              |
| Expense             | Distribution Aerial Sharing Fraction - 5          | 0.5                                 | 0.33                             |
| Expense             | Distribution Aerial Sharing Fraction - 100        | 0.5                                 | 0.25                             |
| Expense             | Distribution Aerial Sharing Fraction - 200        | 0.5                                 | 0.25                             |
| Expense             | Distribution Aerial Sharing Fraction - 650        | 0.5                                 | 0.25                             |
| Expense             | Distribution Aerial Sharing Fraction - 850        | 0.5                                 | 0.25                             |
| Expense             | Distribution Aerial Sharing Fraction - 2550       | 0.35                                | 0.25                             |
| Expense             | Distribution Aerial Sharing Fraction - 5000       | 0.35                                | 0.25                             |
| Expense             | Distribution Aerial Sharing Fraction - 10000      | 0.35                                | 0.25                             |
| Expense             | Distribution Buried Sharing Fraction - 0          | 1                                   | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 5          | 1                                   | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 100        | 0.85                                | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 200        | 0.65                                | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 650        | 0.65                                | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 850        | 0.65                                | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 2550       | 0.55                                | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 5000       | 0.55                                | 0.33                             |
| Expense             | Distribution Buried Sharing Fraction - 10000      | 0.55                                | 0.33                             |
| Expense             | Distribution Underground Sharing Fraction - 0     | 1                                   | 1                                |
| Expense             | Distribution Underground Sharing Fraction - 5     | 1                                   | 0.5                              |
| Expense             | Distribution Underground Sharing Fraction - 100   | 0.85                                | 0.5                              |
| Expense             | Distribution Underground Sharing Fraction - 200   | 0.65                                | 0.5                              |
| Expense             | Distribution Underground Sharing Fraction - 650   | 0.65                                | 0.4                              |
| Expense             | Distribution Underground Sharing Fraction - 850   | 0.65                                | 0.33                             |
| Expense             | Distribution Underground Sharing Fraction - 2550  | 0.55                                | 0.33                             |
| Expense             | Distribution Underground Sharing Fraction - 5000  | 0.55                                | 0.33                             |
| Expense             | Distribution Underground Sharing Fraction - 10000 | 0.55                                | 0.33                             |
| Expense             | Feeder Aerial Sharing Fraction - 0                | 0.5                                 | 0.5                              |
| Expense             | Feeder Aerial Sharing Fraction - 5                | 0.5                                 | 0.33                             |
| Expense             | Feeder Aerial Sharing Fraction - 100              | 0.5                                 | 0.25                             |
| Expense             | Feeder Aerial Sharing Fraction - 200              | 0.5                                 | 0.25                             |

| <b>Module/Table Scenario Input</b> |  | <b>FCC SM<br/>Default<br/>Value</b> | <b>HAI<br/>Default<br/>Value</b> |
|------------------------------------|--|-------------------------------------|----------------------------------|
| Expense                            | Feeder Aerial Sharing Fraction - 650         | 0.5                                 | 0.25                             |
| Expense                            | Feeder Aerial Sharing Fraction - 850         | 0.5                                 | 0.25                             |
| Expense                            | Feeder Aerial Sharing Fraction - 2550        | 0.35                                | 0.25                             |
| Expense                            | Feeder Aerial Sharing Fraction - 5000        | 0.35                                | 0.25                             |
| Expense                            | Feeder Aerial Sharing Fraction - 10000       | 0.35                                | 0.25                             |
| Expense                            | Feeder Underground Sharing Fraction - 0      | 1                                   | 0.5                              |
| Expense                            | Feeder Underground Sharing Fraction - 5      | 1                                   | 0.5                              |
| Expense                            | Feeder Underground Sharing Fraction - 100    | 0.85                                | 0.4                              |
| Expense                            | Feeder Underground Sharing Fraction - 200    | 0.65                                | 0.33                             |
| Expense                            | Feeder Underground Sharing Fraction - 650    | 0.65                                | 0.33                             |
| Expense                            | Feeder Underground Sharing Fraction - 850    | 0.65                                | 0.33                             |
| Expense                            | Feeder Underground Sharing Fraction - 2550   | 0.55                                | 0.33                             |
| Expense                            | Feeder Underground Sharing Fraction - 5000   | 0.55                                | 0.33                             |
| Expense                            | Feeder Underground Sharing Fraction - 10000  | 0.55                                | 0.33                             |
| Expense                            | Feeder Buried Sharing Fraction - 0           | 1                                   | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 5           | 1                                   | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 100         | 0.85                                | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 200         | 0.65                                | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 650         | 0.65                                | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 850         | 0.65                                | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 2550        | 0.55                                | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 5000        | 0.55                                | 0.4                              |
| Expense                            | Feeder Buried Sharing Fraction - 10000       | 0.55                                | 0.4                              |
| Expense                            | Motor Vehicles - Economic Life               | 8.24                                | 8                                |
| Expense                            | Garage Work Equipment - Economic Life        | 12.22                               | 10                               |
| Expense                            | Other Work Equipment - Economic Life         | 13.04                               | 13                               |
| Expense                            | Buildings - Economic Life                    | 46.93                               | 35                               |
| Expense                            | Furniture - Economic Life                    | 15.92                               | 20                               |
| Expense                            | Office Support Equipment - Economic Life     | 10.78                               | 12                               |
| Expense                            | Company Comm. Equipment - Economic Life      | 7.4                                 | 8.5                              |
| Expense                            | General Purpose Computer - Economic Life     | 6.12                                | 6                                |
| Expense                            | Digital Electronic Switching - Economic Life | 16.17                               | 16.5                             |
| Expense                            | Operator Systems - Economic Life             | 9.41                                | 10.6                             |
| Expense                            | Digital Circuit Equipment - Economic Life    | 10.24                               | 11.5                             |

| <b>Module/Table Scenario Input</b> |   | <b>FCC SM<br/>Default<br/>Value</b> | <b>HAI<br/>Default<br/>Value</b> |
|------------------------------------|---|-------------------------------------|----------------------------------|
| Expense                            | Public Telephone Terminal Equipment - Economic Life | 7.6                                 | 8                                |
| Expense                            | Poles - Economic Life                               | 30.25                               | 32                               |
| Expense                            | Aerial Cable - metallic - Economic Life             | 20.61                               | 21                               |
| Expense                            | Aerial Cable - non metallic - Economic Life         | 26.14                               | 30                               |
| Expense                            | Underground Cable - metallic - Economic Life        | 25                                  | 26                               |
| Expense                            | Underground Cable - non metallic - Economic Life    | 26.45                               | 30                               |
| Expense                            | Buried - metallic - Economic Life                   | 21.57                               | 24                               |
| Expense                            | Buried - non metallic - Economic Life               | 25.91                               | 30                               |
| Expense                            | Intrabuilding Cable - metallic - Economic Life      | 18.18                               | 11.5                             |
| Expense                            | Intrabuilding Cable - non metallic - Economic Life  | 26.11                               | 30                               |
| Expense                            | Conduit Systems - Economic Life                     | 56.19                               | 59                               |
| Expense                            | Motor Vehicles - Net Salvage %                      | 0.1038                              | 0.12                             |
| Expense                            | Garage Work Equipment - Net Salvage %               | -0.0558                             | -0.06                            |
| Expense                            | Other Work Equipment - Net Salvage %                | 0.0169                              | 0.03                             |
| Expense                            | Buildings - Net Salvage %                           | 0.0164                              | -0.04                            |
| Expense                            | Furniture - Net Salvage %                           | 0.0402                              | 0.03                             |
| Expense                            | Office Support Equipment - Net Salvage %            | 0.0412                              | 0.03                             |
| Expense                            | Company Comm. Equipment - Net Salvage %             | 0.0252                              | -0.01                            |
| Expense                            | General Purpose Computer - Net Salvage %            | 0.0229                              | 0.01                             |
| Expense                            | Digital Electronic Switching - Net Salvage %        | 0.0157                              | 0.03                             |
| Expense                            | Operator Systems - Net Salvage %                    | -0.0041                             | 0.05                             |
| Expense                            | Digital Circuit Equipment - Net Salvage %           | -0.0062                             | 0.01                             |
| Expense                            | Public Telephone Terminal Equipment - Net Salvage % | 0.0512                              | 0.08                             |
| Expense                            | Poles - Net Salvage %                               | -0.8998                             | -1.1                             |
| Expense                            | Aerial Cable - metallic - Net Salvage %             | -0.2303                             | -0.14                            |
| Expense                            | Aerial Cable - non metallic - Net Salvage %         | -0.1753                             | -0.12                            |
| Expense                            | Underground Cable - metallic - Net Salvage %        | -0.1797                             | -0.12                            |
| Expense                            | Underground Cable - non metallic - Net Salvage %    | -0.1458                             | -0.08                            |
| Expense                            | Buried - metallic - Net Salvage %                   | -0.0839                             | -0.06                            |
| Expense                            | Buried - non metallic - Net Salvage %               | -0.0691                             | 0                                |
| Expense                            | Intrabuilding Cable - metallic - Net Salvage %      | -0.1569                             | -0.14                            |
| Expense                            | Intrabuilding Cable - non metallic - Net Salvage %  | -0.1043                             | -0.07                            |
| Expense                            | Conduit Systems - Net Salvage %                     | -0.0995                             | -0.1                             |

| <b>Cable Investment Inputs</b>              | <b>SBC Pacific Values Utilized in FCC SM Run</b> | <b>SBC Pacific Values Utilized as HAI Defaults</b> |
|---|--|--|
| <b>(Contains Proprietary Information)</b>   |  |  |
| Copper Cable Material \$/ft - 4200 - Aerial | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 3600 - Aerial | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 3000 - Aerial | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 2400 - Aerial | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 1800 - Aerial | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 1200 - Aerial | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 900 - Aerial  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 600 - Aerial  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 400 - Aerial  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 200 - Aerial  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 100 - Aerial  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 50 - Aerial   | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 25 - Aerial   | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 12 - Aerial   | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 6 - Aerial    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 4200 - Buried | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 3600 - Buried | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 3000 - Buried | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 2400 - Buried | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 1800 - Buried | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 1200 - Buried | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 900 - Buried  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 600 - Buried  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 400 - Buried  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 200 - Buried  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 100 - Buried  | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 50 - Buried   | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 25 - Buried   | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 12 - Buried   | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 6 - Buried    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 4200 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 3600 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 3000 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 2400 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 1800 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 1200 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 900 - U/G     | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 600 - U/G     | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 400 - U/G     | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 200 - U/G     | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 100 - U/G     | \$xx   | \$xx   |

| <b>Cable Investment Inputs</b>            | <b>SBC Pacific Values Utilized in FCC SM Run</b> | <b>SBC Pacific Values Utilized as HAI Defaults</b> |
|---|--|--|
| <b>(Contains Proprietary Information)</b> |  |  |
| Copper Cable Material \$/ft - 50 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 25 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 12 - U/G    | \$xx   | \$xx   |
| Copper Cable Material \$/ft - 6 - U/G     | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 288 - Aerial | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 216 - Aerial | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 144 - Aerial | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 96 - Aerial  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 72 - Aerial  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 48 - Aerial  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 36 - Aerial  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 24 - Aerial  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 12 - Aerial  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 6 - Aerial   | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 288 - Buried | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 216 - Buried | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 144 - Buried | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 96 - Buried  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 72 - Buried  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 48 - Buried  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 36 - Buried  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 24 - Buried  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 12 - Buried  | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 6 - Buried   | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 288 - U/G    | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 216 - U/G    | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 144 - U/G    | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 96 - U/G     | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 72 - U/G     | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 48 - U/G     | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 36 - U/G     | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 24 - U/G     | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 12 - U/G     | \$xx   | \$xx   |
| Fiber Cable Material \$/ft - 6 - U/G      | \$xx   | \$xx   |

**Attachment TRR-1**

**Attachment TRR-1 is provided separately on compact disc.**

**Attachment TRR-1 contains the following Microsoft Excel files:**

**Block\_Cable\_Impact.xls**

**CA\_Pacific\_Bell\_HCPM\_FCC\_SM\_no\_block(proprietary).xls**

**HAI\_Achieved\_Distribution\_Fill.xls**