seeking to quantify the magnitude of minutes terminated by CLECs. Yet, the purpose for which these estimates were presented were merely to provide some order of magnitude of the huge asymmetry between ISP calls terminated by CLECs versus ILECs. The ILECs could only infer through indirect means how many terminating minutes of the CLECs involved access to the Internet.

We find the measurement of ISP traffic derived from Pacific's "Barry Lear Study" to be unreliable. Due to its absence from the record, the specifics of the study are not known, such as precise dates of traffic data used, amount of sampling and sampling techniques used, confidence level of the resulting data, etc. Moreover, on cross-examination, Mr. Scholl revealed that certain data proffered by Pacific, such as call completion rate for ISP calls, were derived from a separate engineering study. This study, like the Lear Study, also was never submitted for the record. Pacific witness Scholl, while admitting that he did not participate in or review the engineering study, or use it for any of the Pacific cost studies he performed, stated that it involved only 34 (unspecified and not randomly selected) out of 900 end offices.[27]

In the case of their own ISP customers, the ILECs had access to more direct and specific record of call termination. Yet, even here, some questionable assumptions and approximations were involved in reporting the results. Even if we take into account the potential measurement bias and statistical limitations pointed out by the CLECs, the ILECs estimates still provide rough approximations of the differences between CLEC and ILEC terminations of ISP traffic. We are still left with the conclusion that there is a very large asymmetry between CLEC and ILEC terminations, even if it cannot be quantified precisely.

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[27] See Tr. at 1283-1286.

With respect to the question of financial impacts of the asymmetrical flow of traffic, we address that question separately in Section VI.D.

With respect to the question of whether ISP traffic could be separately measured and segregated from other traffic for intercarrier billing purposes, we conclude that such results as presented by the ILECs are too imprecise to be useful. As noted above, the range of possible outcomes using Verizon's estimating methodology produces a range of 130 billion minutes for Pacific and 5.2 billion for Verizon. As we noted above, the ILECs have demonstrated that it may be possible to achieve some approximation of the amount of ISP traffic flows only on a broad level. For example, the ILECs have provided examples of published financial reports of the CLECs in which specific numbers of ISP customers served are identified. By inference, the CLECs must have some means of identifying those customers acting as ISPs in order to identify them in their published financial reports. The question is whether any approximation that could be measured would be reasonably accurate enough to be used for intercarrier billing purposes. We conclude that the range of variability in the estimates presented in this proceeding is too broad to serve as a basis for billing purposes.[28]

Beavais' methodology addressed only the proportion of calls that have longer durations, not the proportion of calls that are ISP-bound calls. Such a

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[28] See Exh. 12 at 13 (Pac-West/Goldstein), where Goldstein testifies that it is impossible to correctly identify each ISP-bound call or Internet-bound call for several reasons, including that ISPs in the United States are not licensed or regulated, the cost of entry is low, and the cost of exit is also low. He testified that: "While some ISPs are very visible and advertise widely, others are small, market to affinity groups, and operate 'beneath the radar' of the larger carriers. They are not obligated to report themselves, so it would be difficult if not impossible to identify all ISPs in operation in any location at any given time, or to accurately track their access traffic."

methodology based solely on call duration to determine the proportion of ISP-bound calls is inherently unreliable because it fails to exclude classes of long-duration calls other than ISP-bound calls (*e.g.*, telecommuting and other calls to corporate LANs, business conference calls, calls to airline reservations offices, etc.). Witness Beauvais appeared to acknowledge, however, that under his methodology, calls other than those bound for ISPs would be treated as part of the ISP-bound aggregate based on their holding times, and he offered no reliable solution for the problem.[29]

Aside from the difficulties in accurately measuring calls delivered to ISPs, an additional measurement difficulty involves distinguishing calls to ISPs which actually involve transmissions over the Internet. As Pac-West witness Goldstein testified, of the calls that are actually made for the purpose of using the Internet, many of them are carried out with no actual connection to the Internet, only a temporary Internet connection, or intermittent connections. When not connected to the Internet, the end user may be connected only to the local server of the ISP or to the ISP modem. As testified by witness Terkeurst, various ISP services utilized by a subscriber would not entail connection to the Internet. For example, retrieving e-mail typically only involves accessing the ISP's local e-mail server. Another example could entail viewing web pages that have been locally stored (i.e., cached) on the server of the ISP. No party has proposed a means by which the minutes of usage for ISP communications can be delineated between those that actually involve connection to the Internet versus those that remain locally with the ISP. Without some means of segregating such minutes of use, measurement process used for billing purposes would yield inaccurate results.

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[29] Tr. 757-760.

C. Does the payment of Reciprocal Compensation to CLECs for Terminating ISP Traffic Constitute a "Windfall"?

1. Overview of Parties' Positions

As one of the reasons supporting their opposition to the payment of reciprocal compensation for ISP traffic, the ILECs claim that it results in windfall profits and subsidies to the CLECs. The ILECs claim that the reciprocal compensation rate paid for local traffic significantly exceeds the actual costs incurred by the CLEC to deliver a call to an ISP, resulting in "windfall" profits. The ILECs claim that since the reciprocal compensation rates are predominantly based on the termination costs for local voice calls, the application of the same rate to ISP calls significantly overcompensates the CLECs. Pacific claims that at least 50% of reciprocal compensation revenues paid to CLECs constitute pure profit, and possibly even more. (Scholl Exh. 106, pp. 19-23.)

The ILECs attribute the lower costs of delivering ISP traffic to differences in the type of facilities and processes used in comparison with those used by the ILECs that are used for delivering voice traffic, as well as to differences in the characteristics of ISP calls, themselves. The ILECs claim that ISP calls (1) are longer, on average, than voice calls; (2) exhibit a higher call completion ratio than voice calls; (3) are made to called parties that are likely to be collocated with the CLEC; (4) require more ILEC tandem switching and transport than voice calls; (5) represent traffic that is aggregated by the ILEC before being delivered to the CLEC; and (6) can be switched by the CLEC at a lower cost than voice traffic. By being required to pay reciprocal compensation rates based upon the higher costs of terminating voice traffic, the ILECs argue, the resulting payments constitute a "subsidy" to CLECs and result in "windfall" profits.

The CLECs argue that the ILECs' "windfall"/"subsidy" argument is inconsistent and cannot be reconciled with the FCC's determination that symmetrical compensation should be applied to all local traffic.

The FCC First Report and Order provided for the payment of reciprocal compensation for local traffic based on "symmetrical rates based on the incumbent LEC's costs for transport and termination of traffic . . . " *Id.* at ¶ 1089; *see*, 47 C.F.R. § 51.711(a).

The CLECs also deny that their ISP termination costs are lower than costs for other traffic termination and claim the ILECs misconstrue the manner in which CLEC switches have been deployed. ICG claims the alleged differences in call completion ratios, digital to analog conversions and other purported differences between ISP-bound calls and non-ISP-bound calls, even if they could be accurately determined, are irrelevant to a proper determination of terminating switching costs for such traffic. ICG attributes each of the individual arguments made by the ILECs in attempting to distinguish costs associated with ISP-bound traffic from other types of traffic as either (a) factually inaccurate, (b) irrelevant to the derivation of traffic sensitive costs, or (c) already accommodated by the rate structure included in interconnection agreements."

2. Discussion

The Act prescribes an overall framework by which carriers are to be compensated for their costs of providing competitive local exchange telecommunications services. There are three general categories of service that a LEC provides. These are (1) connecting its own customers to the telecommunications network; (2) permitting its own customers to originate traffic destined for customers of its own (or other LECs') networks; and (3) terminating traffic destined for its own customers that was originated by customers of its own (or those of other LECs). (Starkey/pg.17-18).

Under the Act, reciprocal compensation only applies to the third category of service, namely the termination of calls. Specifically, reciprocal compensation is intended to cover the "traffic-sensitive" costs incurred for transport and termination of local traffic, that is, those costs that vary directly as a function of the traffic usage involved with the call. As prescribed in its Local Competition Order (§ 1057), the costs of terminating traffic that are not traffic sensitive (e.g., local loops and line ports), are not to be included in the reciprocal compensation allowance. Instead, these costs must be recovered from each carrier's own end-use customers. The FCC has determined that such reciprocal compensation obligations "apply only to traffic that originates and terminates within a local area;" they "do not apply to the transport or termination of interstate or intrastate interexchange traffic." (Local Competition Order 11 FCC Rcd. 15499, 16013, § 1034 (1996).)

The FCC has defined "transport" in this context "as the transmission of terminating traffic that is subject to Section 251(b)(5) from the interconnection point between the two carriers to the terminating carrier's end office switch that directly serves the called party (or equivalent facility provided by a non-incumbent carrier)." (Local Competition Order at § 1039, *see* 47 CFR § 51.701(c).) "Termination" is defined as "the switching of traffic that is subject to Section 251(b)(5) at the terminating carrier's end office switch (or equivalent facility) and delivery of that traffic from that switch to the called party's premises." (Local Competition Order at § 1040; see 47 CFR § 51.701(d).)

FCC rules implementing the 1996 Act call for the use of the Total Element Long Run Incremental Cost (TELRIC) of the ILEC as a proxy for CLEC costs rather than separately requiring CLEC-specific cost studies. Section 51.711 requires that reciprocal compensation rates be "symmetrical" and defined as: "rates that a carrier other than an incumbent LEC assesses upon an incumbent LEC for

the transport and termination of local telecommunications traffic equal to those that the incumbent LEC assesses upon the other carrier for the same services." Pursuant to the existing FCC rules, therefore, ILECs must charge the CLECs a rate for reciprocal compensation based on the ILEC's costs, and the CLEC must likewise charge the ILEC the same rate (based on the ILEC's costs). There is no option under the FCC's rules for an ILEC or state commission to impose asymmetrical rates for traffic deemed to be "local." Because the FCC rules require that reciprocal compensation rates be based on the level of the ILECs costs, ICG argues that in any event, the Commission does not need to know the current level of actual CLEC costs. Therefore, in the scoping memo for this proceeding, we did not ask CLECs to produce separate cost studies, but rather, sought inquiry concerning the cost characteristics of those functions that are involved in the termination of traffic. Our long standing policy as originally adopted in D.96-03-020 has been not to impose separate cost study requirements on CLECs, recognizing the administrative burden such studies would impose, and the lack of market power that CLECs exercise. Therefore merely because the CLECs did not produce their own comprehensive cost studies in this proceeding, we should not conclude that the CLECs failed to make a proper evidentiary showing. Thus, the cost principles underlying TELRIC provide a relevant standard in evaluating the costs of terminating ISP traffic by either the ILEC or the CLEC.

Federal TELRIC rules require that the cost of a "particular element must be derived by dividing the total cost associated with the element by a reasonable projection of the actual total usage of the element."[30] Thus, it is consistent with the TELRIC methodology to apply one uniform TELRIC-based

[30] See FCC Local Competition Order at § 682.

rate for all calls that are subject to termination using the same facilities. The CLECs have shown that they terminate ISP calls using the same facilities as are used to terminate other local calls. Therefore, there is no basis to disaggregate one particular customer class, such as ISPs, and treat them as having a different cost since to do so would contradict the TELRIC principles of costing based upon the total cost of a discrete network element.

The reciprocal compensation rates currently in place for interconnection agreements between Pacific and various CLECs are based on the TELRIC as adopted in the OANAD proceeding applicable to Pacific's unbundled network elements (UNEs) for terminating switching and transport costs. The rates are reciprocal in that each LEC pays that rate to the other LEC for any local traffic that is terminated. Thus, no separate cost studies are performed for the CLEC, but the ILEC's TELRICs are deemed to be acceptable proxies of CLEC costs for purposes of paying reciprocal compensation. The UNE rates for Pacific are disaggregated into two components, as follows:

$.007 per call

$.00187 per minute

The per-call rate is fixed irrespective of the duration of a particular call. The per-minute rate reflects those costs that vary in relation to the volume of traffic terminated. Thus, costs that are not traffic sensitive would not be relevant in evaluating a carrier's actual cost of terminating local traffic subject to reciprocal compensation.

The Commission has not yet established TELRICs for Verizon in OANAD. The rates that the Commission approved in GTE California's (now Verizon's) interconnection arbitration with AT&T in January of 1997 have effectively served as default rates for UNEs and for reciprocal compensation insofar as parties have been able to opt into those rates. The reciprocal compensation

charge established in that proceeding and set forth in the interconnection agreement with AT&T is a per-minute charge of $.003629/minute. (*See* Tr. 29:1-30:10 & Exh. 5 (GTE/AT&T Interconnection Agreement Excerpt) at Attachment 14, App. 1, p. 4.) Although Verizon has, in some instances, been able to negotiate different rates, this ability is limited by the availability of the AT&T rate.

Verizon's reciprocal compensation rate is typically set equivalent to its end-office switching UNE.[31] Unlike Pacific, Verizon only one blended UNE rate for end-office switching,[32] rather than separate rates for "terminating" and "originating" switching. As result, the rate includes the cost of using certain origination-related switch equipment – such as dual tone multi-frequency (DTMF) receivers and tone generators[33] – that a CLEC does not use when it terminates calls to ISPs. Verizon argues that having origination functions in the reciprocal compensation charge overstates the termination cost regardless of the type of traffic at issue. We believe that if origination functions are included in Verizon's reciprocal compensation charge for ISP-bound traffic, those costs should be stripped out.

We find no necessity that CLEC costs must exactly equal the ILEC costs in every respect to justify the payment of reciprocal compensation for ISP calls. By virtue of being an aggregate of total costs, the TELRIC measure may well

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[31] See Exh. 5 (GTE/AT&T Interconnection Agreement Excerpt) at Attachment 14, Appendix 1, pp. 2, 4 (setting both the "end office switching" rate and the "local interconnection" rate at the same level exception for rounding ($.0036286 versus $.003629)).

[32] See *id*. at Attachment 14, Appendix 1, p. 2.

[33] Exh. 2 (ICG/Starkey) at 16.

deviate from the specific cost for any one particular type of call termination. If the CLEC is able to terminate ISP-bound calls at a cost below the TELRIC rate, that, in itself, is no basis to conclude that the CLEC is earning a "windfall" or is not entitled to be compensated by the ILEC at all. The use of TELRIC as a standard for compensation on a reciprocal basis provides a benchmark against which all carriers must manage to provide terminating services at the lowest cost possible.

To the extent that ISP calls may have certain characteristics that distinguish them from voice calls, we conclude that difference, in itself, doesn't justify excluding ISP calls from reciprocal compensation. The ILECs repeatedly compare ISP calls to voice calls, but fail to definitively compare ISP calls with other data-related or other specialized business-related calls. If ISP calls were to be earmarked for disparate treatment from all other local calls, we would also need to consider whether such treatment constituted a form of unfair discrimination. We would need to consider whether certain types of calls other than voice calls that may exhibit similar characteristics to ISP calls such as longer duration or higher volume such that they should also be exempted from reciprocal compensation, or at least compensated at a different rate.

The ILECs however, claim, to use the term "windfall" and "subsidy" to characterize the difference between the TELRIC rates paid and the true costs incurred by the CLECs to deliver ISP traffic. The ILECs do not precisely quantify a standard as to how much of a profit margin may constitute a "windfall." The ILECs' primary argument appears to be, however, that the marginal CLEC profit is so huge, however, that a precise threshold need not be drawn.

Based on our review of the parties' allegations, we do not find evidence of huge differences in the cost of termination of ISP-bound traffic compared with that of all other local traffic. Whatever differences may exist between specific calls on an individual basis, however, do not rise to the level of

"windfall" profits. In the context in which it is used here, the term "windfall" implies an unearned profit advantage unfairly gained by the CLECs at the expense of the ILECs. Yet, in order to conclude that such reciprocal compensation was unearned, we would have to find that the CLEC collects the funds without performing a commensurate function or service of benefit to the ILEC or its customer. Yet, on the contrary, the CLEC does perform a necessary function. If the CLEC did not terminate the ISP call, the call originator would be unable to access the ISP or to utilize its services. In the alternative, the call originator would have to find an ISP served by the ILEC and the ILEC would have to terminate the call, itself, incurring its own TELRIC in the process.

We consider below and respond to the specific arguments presented that termination cost of ISP calls is significantly less than other local calls.

3. Specific Factors Claimed to Result in Lower CLEC Costs for Terminating ISP Calls

a) Differences in Network Configurations and Facilities Used

(1) Parties' Positions

Pacific argues that while the ILEC is required to maintain a network that serves all types of customers over a wide geographic area, CLECs may pick and choose which types of customers to serve, such as ISPs. As a result, Pacific claims that CLECs can limit the number of facilities they build, and deploy lower-cost networks with less functionality than Pacific's. Pacific argues that ISPs are frequently collocated in the CLEC central offices. In those cases, argues Pacific, no CLEC loop plant is involved in transporting traffic to the ISP. Thus, Pacific believes that it is placed at an unfair competitive disadvantage by having to compensate CLECs at a rate that significantly exceeds the CLECs' true costs.

Pacific also claims that CLECs are able to lower their termination costs for ISP traffic through the use of new generation routing products that do not use a traditional voice circuit switch to deliver ISP traffic. Witness Hamilton describes this new generation equipment as an "Internet Gateway." Hamilton testified that this new technology enables CLECs to replace several pieces of equipment used in traditional switching as well as the Class 5 switch. Because this equipment is designed specifically for ISP calls, Hamilton states that it obviates the need for many of the traditional voice switching features. This technology generally cannot be used to originate traffic, but merely receives and routes traffic to an ISP. Because of the reduced functionality, Hamilton argues that it follows that these Internet Gateways will have lower costs.

Moreover, Pacific claims that the configuration of the CLECs' facilities forces Pacific to incur additional transport and switching costs in delivering ISP traffic to CLECs' points of interconnection, rather than directly to ISPs.[34] Pacific claims it incurs the additional costs because CLECs have generally chosen not to establish a point of interconnection in each of the local calling areas where ISPs originate calls. Pacific argues that CLECs often design their networks to have only a few points of interconnection per LATA, thus causing Pacific significant transport costs to haul traffic from the originating point to these locations. Pacific argues that the typical configuration of CLEC networks is actually adding costs to Pacific. Moreover, Pacific claims it is not equitable that when Pacific serves an ISP, it has to fund termination costs from the services ISPs buy or from other customers, while CLECs may look to Pacific to cover their costs.

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[34] Exh. 106 (Pacific/Scholl), pp.11-12; Exh. 123 (Pacific/Hamilton) pp. 5-9, 11-13, 18-19.

Various CLECs actively participating in this proceeding provided testimony and written comments on the configuration of their facilities used to transport and terminate ISP traffic. Level 3 states that the principal architectural differences between ILEC and CLEC networks arise largely in the relative mix of the switching and transport components. ILECs generally have a hierarchical network, so that within a given geographical area, multiple end offices subtend on tandem offices. These tandem offices aggregate traffic and network management functions associated with the area served by each of the end offices subtending it. Because the ILECs have millions of subscribers statewide, they can afford to deploy relatively efficient, large-scale switching systems in close geographic proximity to their customers.

Level 3 argues that while many CLEC networks are physically configured differently than ILEC networks, they provide the same functionality for all local communications traffic, including ISP bound traffic. Pac-West witness Selwyn explained that CLEC and ILEC networks are generally comprised of three principal components: subscriber loops, end office switches, and interoffice network, which are trunking and switching facilities that provide interconnections among end offices and between end offices and other carriers. In contrast, a CLEC's customer base is only a small fraction of the size of the ILEC's customer base. As such, in lieu of using tandems and multiple end offices, CLECs typically deploy a small number of large switches which perform both tandem and end office functionalities to serve a comparable geographic area to that of the ILEC. CLECs transport their customers' traffic over relatively large distances. Because transport costs have become far less distance-sensitive with the use of high-capacity fiber optics, enormous amounts of capacity can be deployed at little more than the cost of more conventional transport capacity sizes.

ICG witness Wood acknowledges that ISPs may use a variety of facilities to connect with the serving LECs switch, but denies that the choice of facilities or methods of connection has any impact on the usage sensitive costs which are the only relevant costs recoverable through reciprocal compensation. ICG claims that that the characteristics of the particular facility used by a LEC to deliver traffic to its own customers is irrelevant to the rate for reciprocal compensation because the costs of these facilities are non-traffic sensitive, and are recoverable from end users. Moreover, regardless of what type of facilities are used to provide service for a specific type of customer, i.e., ISPs, when a CLEC uses a fully functional switch, it is purchasing the ability to service all line types. At the switch matrix level, which is the basis for costing out reciprocal compensation rate, a call path is assigned at the individual channel level, without reference to the type or capacity of the physical facility connecting the switch to the end user.

ICG's network is built upon an architecture that can generically be referred to as a SONET Ring architecture. These SONET rings are comprised of fiber optic facilities and multiplexing equipment that provides for aggregating, connecting and dispersing an individual customer's traffic to a larger SONET data stream. Witness Starkey testified that ICG employs a common network that is used to service its entire customer base. Both general business customers as well as data customers (primarily ISPs) use the same switches, fiber optic backbone and SONET rings for accessing the network, as well as for originating and terminating calls. Starkey testified that ICG employs fully functional Class 4/5 circuit-based switches (i.e., Lucent Technologies' 5ESS) that are shared by all of its local exchange customers. Focal denies that it uses the new technologies referenced by Pacific in terminating ISP traffic in California. Focal

states that it utilizes Nortel DMS-500 switches in California that provide all of same call origination functionalities offered by the ILECs.[35]

ICG argues that because of the lumpiness inherent in switching investments and the fact that CLECs began to compete without an embedded customer base, any given CLEC may experience per-minute switching costs that are actually higher than those of the ILEC, including the cost of calls delivered to ISPs. ICG denies that any relevant cost differences exist between ILECs and CLECs that would justify paying an asymmetrical rate for reciprocal compensation.

(2) Discussion

It is an uncontested fact that CLECs networks tend to be configured differently from those of the ILECs in the manner described above. The relevant inquiry, however, is whether the CLECs' network differences cause significantly lower traffic-sensitive terminating switching and transport costs of the type that are recoverable through reciprocal compensation. We conclude that while the differences in network configurations between ILECs and CLECs may result in various differences in costs, those differences generally do not relate the traffic-sensitive terminating transport and switching costs that are the subject of reciprocal compensation. Rather, they relate to the non-traffic sensitive costs that are already recovered from end users.

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[35] In its reply brief (pp. 9,10), Pacific requested to have admitted as a late-filed exhibit a press release posted on Focal's website purporting to show that Focal was replacing its DMS-500 switches with ICS2000 broadband switches at a lower cost. Focal filed an objection on October 6, 2000 on procedural and substantive grounds. We decline to admit the proffered document as a late-filed exhibit. Since the hearings have ended, Focal has had no opportunity to offer a witness to explain or refute Pacific's characterization of the exhibit. Late-filed admission of the document is denied.

Based on the testimony of witnesses noted above, we find that the CLECs generally use fully functional switches that offer both originating and terminating functions, and that are used to serve all of their customers, not just ISPs. ICG witness Starkey testified that ICG is a full service provider that uses a fully functional Class 4/5 circuit-based switches that are shared by all of its local exchange customers. (Rebuttal of Starkey; Exh. 2 at page 2.) Thus, whatever cost savings the CLECs may be able to achieve in successfully managing their switching resources, there is no basis to conclude that they fail to provide complete functionality on par with that offered by the ILECs.

Likewise, the question of whether the ILECs incur higher originating transport costs as a result of differences in network configuration is separate and distinct from the question of what are CLEC's termination costs. We have designated a later phase of the proceeding for consideration of issues relating to intercarrier compensation for transport charges incurred by originating carriers based upon differences between the rating and routing points of calls. We make no final determination in this decision concerning the level of transport costs that Pacific incurs in originating and delivering local traffic to CLECs points of interconnection or what forms of intercarrier compensation may be warranted for such originating costs. We do note, however, that Pacific's originating transport cost estimates assumed the point of interconnection was always located at or near the CLEC's switch so that Pacific would be responsible for providing interconnection trunks from its switch to the CLEC's switch. (Tr. At 1534; Hamilton.) On cross-examination by Pac-West, however, Pacific witness Hamilton testified that the length of interconnection trunks assumed by Pacific was based on a data base which erroneously measured the distance from the Pacific switch to the CLEC switch, rather than to the point of interconnection. (Tr. at 1593-94; Hamilton) Pac-West witness, Mills, however testified that numerous

points of interconnection in the Pacific/Pac-West interconnection agreement are not at the Pac-West switch. (Tr. At 1593-94; Mills)

In any event, Pacific's arguments concerning its costs of originating transport charges are not unique to ISP traffic, but apply equally to any and all calls transported to another carrier for termination. Every call that originates on Pacific's network that is handed off to another carrier for termination will necessarily require Pacific to transport the call to the relevant point of interconnection with the other carrier's network. In certain circumstances, Pacific may incur higher originating transport costs to hand off calls to another carrier rather than to terminate the call over its own system with no interoffice transport required and no intermediary switching operations. Yet, the distinction being drawn is not between termination of ISP traffic versus other local traffic. Rather, the distinction that Pacific draws is between the ILEC exclusively handling the origination and termination of any type of call versus a CLEC handling both the termination portion of any call. In other words, it is actually the introduction of a competitive element into the process that gives rise to Pacific's claim of higher transport costs. The question before us here, however, is not to second-guess the merits of competition, itself, not to probe how carriers choose to establish points of interconnection in a competitive setting. Instead, the focus of our inquiry here is on the functions and cost characteristics relating to the *terminating* end of ISP calls.

b) Longer Call Duration of ISP-Bound Traffic

(1) Parties' Positions

Pacific Witness Scholl conclude that "ISP-bound calls delivered to CLECs" are "typically much longer in duration" than a "traditional" voice call. They state that "ISP-bound traffic on Pacific's network during 1999 averaged 29 minutes in duration." By comparison, Pacific reports that the average

duration of a local voice call originated by flat-rate residential service in 1994 (prior to the growth of ISP traffic) was 3.78 minutes.[36]

In 1994, Pacific reported average local usage per flat-rate residential line of 19 minutes per day. By comparison, America Online (AOL), a major ISP, reported 52 minutes of usage per day by its customers for Internet access. Pacific argues that these comparisons highlight the difference between ISP and other types of calls.

Verizon witness Beauvais testified that ISP-bound calls average between 20 to 30 minutes per call.[37] Some of the data supporting this duration were collected from trunks devoted solely to ISPs and thus, include no traffic delivered to local plain old telephone services (POTS) customers.[38] Other data come from a study that involved specifically identifying ISP telephone numbers and verifying the traffic as modem traffic by calling the identified numbers.[39] Similar studies performed by Pacific and Roseville Telephone Company (Roseville) show average call duration times for ISP-bound calls of 29 and 25 minutes per call.[40]

Beauvais testified that there are a variety of other sources that reflect average holding times for ISP-bound traffic that are 30 minutes or

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[36] Exh. 107-C (Pacific/Scholl) at 9-10.

[37] Exh. 78 (Verizon/Beauvais) at 12-13; Exh. 106 (Pacific/Scholl) 8-9; Tr. 1833:14-21 (Roseville/Gierczak).

[38] Exh. 78 (Verizon/Beauvais) at 12.

[39] *Id.* at 12 and Exh. 80.

[40] *See*, e.g., Exh. 106 (Pacific/Scholl) 8-9; Tr. 1833:14-21 (Roseville/Gierczak).

greater.[41] An independent entity – Nielsen/NetRatings –calculated an average ISP-bound call duration of 30 minutes and 27 seconds.[42] Traffic data that a CLEC provided to Verizon in Michigan – and that the relevant CLEC confirmed was purely ISP-bound traffic – displayed an average holding time of 42 minutes per call.[43]

Various CLECs have argued longer hold times are not unique to ISP calls, in that particular local voice calls or types of call traffic – for example, traffic in households with adolescents who make long calls to their friends – potentially overlap with the hold times of ISP-bound calls.[44] The ILECs witnesses consistently use the term "voice calls" to describe calls that are not delivered to ISPs. The CLECs claim this is a false dichotomy. A significant volume of non-voice (data) calls exists that is unrelated to, and does not involve, ISPs, (i.e., some calls that are not voice calls are also not ISP-bound calls.) Conversely, not all calls to ISPs are data calls, some are voice calls. As a result, while it may be meaningful to refer to "voice" vs. "data" calls, it is not accurate or appropriate to place all calls to ISPs into either classification. Verizon responds, however, that the arbitrage opportunity presented to CLECs under the existing regulatory regime arises in part from the difference in the average duration of ISP-bound calls in the aggregate as compared to the average duration of voice calls. The longer average duration for ISP-bound calls reduces the per-minute cost of the "call set-up" i.e., the costs that occur on a per-call basis, but do not vary with the length of the call. Since

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[41] Exh. 78 (Verizon/Beauvais) at 10-13.

[42] *Id.* at 12-13.

[43] *Id.* at 11.

[44] Exh. 61 (Focal/TerKeurst) at 23-24.

Verizon's reciprocal compensation rate does not separate out this fixed component, Verizon must pay CLECs for every additional minute even though there is no corresponding increase in per-minute costs. Because of the longer duration of ISP calls, Verizon claims that CLECs receive at least five times more for the call set up allowance than the fixed cost of performing the service would merit. Verizon understands that Pacific's default reciprocal compensation rates separate out the costs between a flat per-call set-up fee and a per-minute charge, and thus, apparently the overpayment due to call duration is an issue unique to Verizon.

The CLECs claim that Pacific and Verizon do not know the average duration of an ISP-bound call (whether delivered by a CLEC or Pacific). As described in response to ICG's Data request No. 18, Pacific has attempted to estimate the number and characteristics of calls to ISPs (delivered on its own network or by a CLEC). ICG argues that the process used has been thoroughly discredited in other states as being over-broad and inaccurate.

The CLECs note that Verizon's Beauvais cites to data that "is rather dated and is not California-specific,"[45] yet he concludes that the average holding time for voice calls is approximately 4.8 to 4.9 minutes in Illinois. He then compares this to data from a single CLEC in Michigan, and concludes that the average holding time for calls to ISPs is approximately 42 minutes, though "limited data" that Verizon has collected for California suggests an average duration for JSP calls of 20 to 30 minutes.

(2) Discussion

We find that the data studies presented by the ILECs concerning call duration estimates produce rather wide variations, and fail to

[45] Exh. 78 (Verizon/Beaurais) at 10.

provide any estimates that would be useful for quantifying a specific difference in the cost of an average ISP call versus all other local calls. We have already discussed various defects in the ILECs' studies of call duration previously in Section VI.B. While we acknowledge that the ILECs' call duration studies do not provide precise measures of ISP call duration in relation to that of all other local calls, we do find that on average, ISP call duration appears to measurably exceed the average duration for other local voice calls. Yet, by limiting the comparison only to voice calls, the ILECs fail to take into account the effects of other categories of non-ISP calls that also may have longer-than-average durations compared with voice calls. It would be arbitrary to single out ISP calls as having a longer duration without noting that various other categories of local calls also can have similarly long durations in comparison to all voice calls.

In any case to the extent that the per-minute duration of ISP calls exceeds that of voice calls, we find that the extra duration of ISP calls does not overcompensate CLECs, at least with respect to Pacific's payments. Pacific's reciprocal compensation payments incorporate its adopted TELRICs for switching which separate out a "per-call" charge that does not increase based on the duration of a call. Thus, CLECs only receive per-minute compensation for the TELRIC component that varies with minutes of use. Pacific witness Scholl acknowledged that once an ISP call is established, the unit cost per additional minute is typically going to be a constant amount. (Tr. 1074-1075). Therefore, any increase in reciprocal compensation revenues for longer duration calls would be offset by a corresponding increase in variable costs incurred by the CLEC for each additional minute.

In the case of Verizon, however, no fixed cost set up component is segregated out of its UNE rates. Therefore, we agree with Verizon that CLECs recover additional reciprocal compensation revenues related to

longer-than-average duration ISP calls that exceeds the additional costs incurred by the CLEC. We conclude, however, that the proper remedy to this disparity is not to eliminate reciprocal compensation, but rather to properly design Verizon's reciprocal compensation rates to separate out the non-variable UNE component, as already reflected in Pacific's rates. The OANAD proceeding is the proper forum to implement this rate realignment.

c) Higher Call Completion Ratio

(1) Parties' Positions

Pacific also identifies a higher call completion ratio for ISP as opposed to other calls. Pacific reports that normal voice calls are answered about 75% of the time whereas Internet calls are answered 95% of the time since they are answered by machines. Pacific claims the higher completion ratio reduced the TELRIC of the terminating switch set-up per completed call. Although TELRICs for terminating switching set-up costs are incurred on a per-attempt basis, they are billed only on completed calls. Thus, Pacific calculated a conversion factor to adjust its TELRIC based upon the higher call completion ratio for ISP calls. Using the Commission-adopted TELRIC for terminating switching set up of $0.007 per call, Pacific calculated a 14% minimum rate reduction comparing local voice calls versus ISP-bound calls.

Focal's witness argues that high call completion rates are not necessarily limited to ISP calls, but would apply to any business where a prompt answer of the call is important. Focal argues that because ISP call completion rates are not unique in comparison to completion rates for various other service-oriented businesses, there is no basis to conclude that the ISP call termination costs are unique in this respect.

(2) Discussion

The relative rate of call completion for ISP calls only has meaning in comparison to other specified categories of calls. While the ILECs limit the comparison to residential voice calls only, there are various other categories of local calls besides residential voice calls where higher-than-average call completion ratios similar in nature to ISP calls exist. Businesses that are not service-oriented and residences on the other hand, could reasonably be expected to have lower call completion rates than for ISP calls. This dispute essentially gets back to the basic question of whether it is appropriate to single out ISP calls for separate cost measurement without doing the same for other types of non-residential local calls that may deviate from residential voice call characteristics. As we concluded above, it would produce arbitrary and discriminatory results to single out ISP calls for disaggregating measurement of call completion ratios while ignoring other calls with similar call completion characteristics. Thus, while Pacific's mathematical calculation appears correct indicating a 14% reduction in call set-up costs as a result of the difference in call completion ratios, we still find that this cost differential is not unique to ISP calls. It could apply to various other types of local calls with high call completion ratios.

d) Lower CLEC Switching Costs Due to Use of Trunk-to-Trunk Switching for ISP Calls

(1) Parties' Positions

CLECs typically use high volume Integrated Services Digital Network-Primary Rate Interface (ISDN-PRI) technology to deliver ISP traffic. ISDN-PRI is a digital technology that provides 24 channels of capacity to an end-user customer. An ISDN-PRI line is typically configured with 23 bearer channels that are used to transmit traffic, and one data channel that is used for signaling. The technology is designed to serve the needs of high-volume customers, such as ISPs.

Pacific claims that CLECs' use of these digital facilities to terminate ISP calls require trunk-to-trunk switching that is different from both a technical and routing perspective, and is less costly, than the trunk-to-line terminating end-office switching used for terminating normal local voice traffic. Equipment vendors have developed switches designed for this type of termination. Pacific claims these switches do not perform all the same functions as a traditional voice switch. Witnesses Hamilton (Exh. 123; pp. 7, 21-23), Scholl (Exh. 106; pp. 16, 19-22), and Harris (Exh. 146; pp. 23-24) on behalf of Pacific, and Jones on behalf of Verizon argue that CLEC's experience lower call termination costs as a direct result of the fact that CLECs are delivering a high volume of traffic to ISPs.

Pacific estimated a TELRIC-based CLEC trunk-to-trunk terminating switching set-up price for ISP-bound traffic by applying the ISP-bound traffic completion rate to the price for a tandem switching setup attempt. The tandem switching function is a trunk-to-trunk switching function that Pacific claims is a reasonable surrogate because it reflects a similar terminating function as that performed by CLECs for ISP-bound traffic.

Verizon claims that trunk-to-trunk switching involves the use of different hardware and software to complete the call, as compared with trunk-to-line switching. For example, a switch used to terminate a trunk-to-line call to a POTS ("plain old telephone service") customer has one line card for each POTS customer served. By contrast, Verizon claims a switch delivering a trunk-to-trunk call to an ISP would not use line cards at all, but would use trunk cards carrying much higher traffic volumes per card.

While Verizon recognizes that the line card/trunk card distinction does not directly affect traffic-sensitive costs, Verizon claims an indirect effect exists insofar as other equipment-based differences are triggered. Specifically, witness Jones testified that the number of switch modules varies

directly with the number of line cards or trunk cards, and that the switch modules have some usage-sensitive characteristics that impact reciprocal compensation costs.

The CLECs dispute the ILECs' claims concerning the lower costs of trunk-to-trunk switching. Pac-West argues that the claims of the lower cost of trunk-to-trunk switching are tenuous at best, and in any event, aren't relevant to reciprocal compensation since they are non-traffic sensitive. ICG claims the switching costs of call termination incurred by CLECs is not a function of the type of the customers served. ICG claims it incurs a cost of end office switching that does not vary depending on the identity of the called party whether an ISP or not. ICG disputes the ILECs' claims that trunk-to-trunk switching is less costly than trunk-to-line switching. ICG witness Starkey claims that: the ILECs' "trunk-to-trunk" switching arguments are fundamentally flawed because they depend on cost concepts that are not consistent with a proper TELRIC study. Starkey testified that: "[A]ttempting to derive disparate per-minute-of-use rates for different types of traffic originated by or delivered to a specific subset of customers has no causal validity."[46]

(2) Discussion

We find that the use of trunk-to-trunk switching is not uniquely linked to ISP-bound traffic, but may be used for other forms of local traffic as well. Therefore, any cost savings inferences that could be drawn about the use of trunk-to-trunk switching would not be unique to ISPs, but could also apply to other kinds of local traffic. Moreover, the ILECs failed to establish that the use of ISDN-PRI facilities necessarily entails trunk-to-trunk switching.

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[46] Exh. 2, (Starkey for ICG) at 33..

Pacific witness Hamilton testified that it is impossible to determine whether a CLEC is performing trunk-to-trunk or trunk-to-line switching based merely on the fact that ISDN PRI facilities are used to connect an ISP or other customer to the central office.[47] Hamilton testified that trunk-to-line switching occurs "[w]henever the trunk needs to identify a particular line in order to activate the set of steps it needs to take to connect that path."[48] In contrast, trunk-to-trunk switching occurs "[w]hen [the switch] can ignore the digits beyond the prefix . . . because it's sending [traffic] out in bulk."[49] Hamilton further acknowledges that an ISDN-PRI customer may choose to have a particular telephone number assigned to a particular PRI channel, in which case trunk-to-line switching would occur.[50] Alternatively, the customer may choose not to have a particular telephone number assigned to a particular PRI channel, in which case trunk-to-trunk switching would occur.[51] Hamilton also concedes that the same switch could perform trunk-to-line as well as trunk-to-trunk switching.[52] Consequently, it is impossible to determine whether a CLEC switch is performing trunk-to-line switching or trunk-to-trunk switching or both unless one has examined each particular switch and identified how ISDN-PRI facilities are configured.[53]

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[47] Tr. at 1543-44 (Pacific Witness Hamilton).

[48] Id. at 1544-45.

[49] Id. at 1545.

[50] Id. at 1548.

[51] Id.

[52] Id. at 1590.

[53] Id.