consumer business exceed our business business. Our success has been based on two things the FCC did in 1999. The first was cageless co-location.

The Telecom Act, in several places, speaks about nondiscrimination. But sir and madams, we have been discriminated against, we were denied cageless co-location by the phone companies upon request, we were denied line sharing, which is something that the incumbents use to provide data services themselves. They're able to do so at much reduced cost, at a much better price to consumers because they're able to share lines themselves. Our requests for line sharing were ignored.

We went to the FCC and were successful in persuading the FCC to take the pro consumer action to in fact implement your intent of nondiscrimination by giving us cageless co-location and line sharing and those are the two devices that have promoted Covad, have prompted Covad to go into the consumer space and we shall soon be competing very vigorously with the phone companies and the cable modem service using our right to the line sharing, which is something this bill would take away.

This bill would also take away cageless co-location in addition to line sharing. If Congress is serious about bringing **broadband** services to rural areas what Congress should do is to eliminate the exemption from competition that has been granted to the rural carriers and we would also request that Congress take far more seriously the enforcement of the Telecom Act as it exists today. My company has been subjected to not only violations of the Telecom Act, we've had our contracts breached and fraud has been committed on our company as well.

There was a central office in Menlo Park, which Mr. Ellis's company denied us space for over a year-and-a-half. We proved that. We won a $27.5 million verdict from the arbitration and that is the first success that we expect to see the series of legal actions that we have been forced to undertake to enforce our legal rights. Thank you.

REP. TAUZIN: Thank you very much, Mr. Khanna. Next, Ms. Cindy Schonhaut, I understand the Executive Government and External Affairs Vice President for ICG. You've just been promoted.

MS. CINDY SCHONHAUT: No, but that last promotion was a tough one to get.

REP. TAUZIN: That's a long title. But, welcome, and you're recognized for five minutes.

MS. SCHONHAUT: Thank you, sir. I am Cindy Schonhaut, and I work for ICG Communications. I'm also here representing two trade associations representing competitors, Comtel (ph) and All (ph). ICG is a competitive local telephone company that has actually been around since the late 1980s. We started in Denver, and that's where we're headquartered now. Myself, I've been in telecom almost exactly 20 years, and 10 of those years, I've worked in local competition.

So, myself and the company really do both predate the Telecom Act. Yesterday, I was sitting on the Senate side in Senator Brownback's hearing on his **broadband** deregulation bill, and somebody passed me a note and asked me if I could testify here today because a witness became unavailable. Well, I really did jump out of my chair, because I have been wanting to talk to this subcommittee for a really long time. First of all, to tell you what I

B

US OFFICE PRODUCTS

ATTACHMENT B

BEFORE THE CALIFORNIA PUBLIC UTILITIES COMMISSION

Order Instituting Rulemaking on the Commission's Own Motion into reciprocal compensation for telenh[illegible] traffic transmitted to Intern[illegible] rs modems.	Rulemaking No. 00-02-005

Attachment B

TESTIMONY OF FRED GOLDSTEIN

ON BEHALF OF

PAC-WEST TELECOMM, INC.

Dated: July 14, 2000

Q.1 PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A.1 My name is Fred Goldstein. My business address is at Arthur D. Little Inc., 20 Acorn Park, Cambridge MA 02140. This testimony is prepared on behalf of my client and does not represent an official position of Arthur D. Little Inc. I am a senior consultant in Arthur D. Little's Communications and Information Technology unit.

Q.2 PLEASE SUMMARIZE YOUR QUALIFICATIONS.

A.2 I have worked in the telecommunications and data network field since 1977, when I joined the consulting firm of Economics and Technology Inc. I was later Telecommunications Manager at Bolt Beranek and Newman Inc., and served as a telecommunications consultant and as a strategic planner for the network products business of Digital Equipment Corp. At Digital, I represented the company at ANSI-accredited standards bodies dealing with ISDN, Frame Relay and Asynchronous Transfer Mode ("ATM") networks, and I received three patents for ATM congestion management and switching. I later became a member of BBN Corp.'s Network Consulting Practice, largely dealing with dial-up Internet Service Provider ("ISP") activities. I now belong to the Arthur D. Little practice that deals with telecommunications and information technology. I am the author of the book, **ISDN IN PERSPECTIVE** (Reading MA: Addison-Wesley, 1992) and have taught courses for Northeastern University and National Technological University. I have previously appeared as an expert witness in regulatory proceedings in states including Florida, Massachusetts, New Hampshire, New Jersey and Maryland. I hold a bachelor's degree in Government from Skidmore College.

Q.3 With respect to Factual Issue 2, please explain how the information carried by an Internet-bound call is transmitted from the LEC to the distant Internet host, such as a web site? How much of this traffic actually leaves the state?

A.3 The circuit switched telephone network establishes calls which operate at a fixed speed of 64000 bits per second. Analog local loops require the use of modems to encode data into an audio-like format which in turn is digitized at the originating central office into this 64000 bps stream. Depending upon the modem type and the quality of the local loop, the useable data rate is between 9600 and 53,300 bits per second. However, this is only the raw rate of the modulation scheme. Some bandwidth may then be lost to the V.42 error-correction protocol usually used between the two modems at either side of the local connection.

The telephone circuit literally *terminates* at the ISP's Remote Access Server (RAS), a device which combines the modem bank and router functions with a bulk digital interface such as ISDN Primary Rate. The RAS answers the call, using the same signaling techniques as, for instance, PBX trunk interfaces. It then connects the call to an internal modem. When there is actual data being sent by the originating computer -- an actual IP packet, typically encapsulated within the Point-to-Point Protocol (PPP) – then the RAS takes this data and multiplexes it onto a data circuit that eventually leads to the ISP's data center. In many cases the RAS actually first feeds the data onto an Ethernet Local Area Network; this allows multiple RASs to share a single high-bandwidth uplink. Common RASs have between 24 and 1344 modems apiece.

The connection from the RAS or RAS cluster to the rest of the Internet is a data circuit engineered to meet the average busy-hour load. Dial-up circuits are not used, on average, very intensively. Even though they may have a peak downstream data rate of around 50 kbps (usually much lower), the average downstream usage per modem is more often in the 5-6 kbps range. That is because users are often looking at the information already uploaded, for instance, to a web browser or mail client. Or they are typing in a message, or doing some other local activity, or may even have walked away from the computer without hanging up the connection. Upstream bandwidth utilization, from the subscriber to the ISP, is generally a fraction of the downstream level; most applications, such as web browsing, are asymmetrical.

The nature of the actual connection between the modem bank (RAS) and the Internet backbone varies from case to case. The ISP's RAS is usually, though not always, collocated at the CLEC's facility; this reduces the local loops to in-building wiring. This saves the ISP considerable cost compared to using ILECs who in general do not permit this. Often the ISP who owns the RAS uses dedicated data circuits to connect the output of the

RAS to the ISP's own location. In some cases there is an Internet backbone facility collocated with the CLEC, so only a LAN connection is needed to connect the RAS to the Internet backbone.

Not all ISP-bound data leaving the RAS ever goes to the Internet backbone itself. Indeed, the term "ISP" actually refers to at least three distinguishable functions, often performed by separate companies. Each plays a different role in providing the end user with service. There is thus a "waterfall" effect as the amount of bandwidth delivered by the LEC, always 64000 bps per call, declines to a few kbps per caller at the backbone level.

- The "Access" (IASP) role is the one that interfaces directly with the LEC. An IASP orders dial-up lines, DSL, or other telecommunications facilities on behalf of its customer, the Vertical ISP (IVSP). Internet Access Service Providers are the so-called "rent-a-modem" services that are widely used by both large and small IVSPs. The IASP typically collocates with the CLEC, receives the 64000 bps telephone calls, performs lower-layer processing (RAS functions), and sends packetized data, not telephone calls, to the IVSPs who hire it. Indeed this doesn't even have to be *Internet* data; the Access provider could just as well be provisioning access to corporate networks and non-Internet data services. Note that this use of the word "access" has nothing to do with the common telecommunications service meaning of the term, where it is often an abbreviation of "Exchange Access

Service," which IXCs purchase from LECs for the completion of long-distance calls.

- The "Vertical" role (IVSP) is the most visible portion of the ISP business, and is what most retail end users view as the ISP. It owns the customer relationships and account management. Technically, though, an IVSP is more of a system integrator than network provider. The IVSP is responsible for providing servers such as mail, news, and the subscriber's own web pages. The IVSP may choose to provide web content caching, and is responsible for purchasing adequate backbone bandwidth. The IVSP's facilities are often located at a single site; they have minimal direct contact with the telecommunications industry. There are thousands of small IVSPs around the country, many focused on serving small communities, and there are also some large national ones. A handful provide significant proprietary content but most are merely facilitators of information services. Examples of Internet Vertical Service Providers include Earthlink, AOL, Prodigy, and GTE.net.

- The "Backbone" (IBSP) role is the one that provides long-haul and international connectivity. These are the top-tier providers who have high-speed long-haul circuits. Backbone providers create the fully-connected Internet backbone by passing traffic amongst one another, a process known as *peering*. IVSPs purchase backbone services from these companies.

It is, of course, possible for one ISP to occupy more than one of these roles. Some of the early commercial ISPs, such as PSInet and Network MCI, did all three. But the industry is by now quite specialized. For instance, GTE.net is a retail IVSP that was created by GTE Corp. several years ago using both IASP and backbone services from UUNET. GTE Internetworking (now Genuity, an 82%-owned subsidiary of Verizon), a later GTE acquisition, provides a backbone service to a wide range of large customers, some of them IVSPs. It also has a large web hosting business, which is a vertical service provided to businesses that takes extensive advantage of their backbone. Separately, GTE Internetworking created DiaLinx, its own rent-a-modem service, and also created a customized rent-a-modem service for America Online (AOL).

So while GTE has been in all three sectors, it was not providing all three sectors to the same customers at the same time! Indeed the business-to-consumer GTE.net has been kept at arms' length from what is now Genuity, itself primarily a business-to-business player. AOL, on the other hand, is only active as a Vertical player, predominantly aimed at consumers; it purchases its dial-in service from several IASPs, and likewise purchases its backbone connectivity. MSN and Prodigy (itself now largely owned by PacBell's parent company SBC) do the same. Note that some RBOCs are permitted to own IVSPs but not IBSPs, because only the latter provide inter-LATA service.

Having identified the roles of the different "ISP" players, it is now possible to characterize the flow of traffic. Dial-up modem traffic arrives from the terminating LEC at the IASP, generally in the form of one 64000 bps channel per call. The IASP's modem terminates the call. The caller's modem maintains synchronization with the IASP's modem, keeping the telephone connection open. The IASP's RAS extracts packets of data from the modem's payload. The IASP routes these to the IVSP. At this point, the typical downstream bandwidth is, as noted above, in the range of 5-6 kbps/caller; the rest of the 64000 bps having been discarded by the modems. Since ISPs, including IASPs, are not telecommunications carriers, their activities are now beyond the regulated sphere; ISPs obtain telecommunications facilities or services in order to connect themselves internally and to each other.

The IVSP maintains its own servers. If the caller is sending or receiving electronic mail, for instance, the caller's computer will generally communicate with an IVSP's mail server. This performs a store-and-forward function of relaying outgoing mail *to* the Internet, and storing incoming mail *from* the Internet until the customer's mail client requests it. An ISP subscriber who merely wishes to check his mail can connect to the mail server and never pass any traffic on to the Internet backbone – this probably accounts for quite a large number of dial-up calls, since many ISP subscribers frequently poll their ISP for new mail. Similarly, if the ISP subscriber is reading Usenet News, then he can connect to the IVSP's news server, which again performs a store-and-forward function, storing news articles locally for days or weeks. Usenet is a store-and-forward network that, unlike the World Wide Web, has no centralized servers; readers may only connect to their own ISP's news server. It predates the Internet and was originally based on long distance dial-up bulk data transfer; it only later transitioned to using the Internet. Thus it is designed to minimize backbone usage, and its backbone connectivity is not synchronized with client (end user) activity.

If the ISP subscriber is browsing the World Wide Web, then the IVSP may be providing a web cache that keeps local copies of frequently-viewed pages in order to speed response time. Some ISPs have reported being able to cache up to 30-40% of web page requests, although caching is by no means universal. Cached pages, of course, do not make use of the backbone.

Since the IVSP is the company who maintains the customer relationship, the caller might be connecting to the IVSP's own web server to perform an administrative function, such as looking for technical help. This is also often done via e-mail, which of course in this case doesn't use the public Internet.

Thus the traffic that leaves the RAS and goes to the IVSP may stop at the mail, news, web cache or internal server. Only the Internet traffic that does not fall into these categories actually goes to the backbone, at which point the services of the backbone provider's network are engaged.

Of the data that goes on to the backbone from California customers, some leaves the state and some remains within. Some Internet traffic is largely local in nature, such as local news sites. A disproportionately large percentage of world wide web traffic converges in California. The state is the home to many Internet-related businesses. Numerous portal sites, such as Yahoo, and content providers, such as Disney, are based in California, and the state also has large web-hosting facilities that are used by in-state and out-of-state content providers (who are not ISPs, but customers of ISPs). It has more Internet facilities than any other state or, for that matter, foreign country, making it unique. Thus the average share of interstate traffic generated out of every 64000 bps dial-up telephone connection is probably well below 8%.

From this we can conclude that the nature of the traffic carried across dial-up Internet connections is very different from the traffic sent to telecommunications carriers. The call clearly terminates, in every sense of the word, within the state; the payload of the telephone call is itself a melange of modem synchronization bits, ISP-local traffic, in-state traffic, and long-haul backbone traffic.

Q.4 With respect to Factual Issue 3, what are typical characteristics of ISP-bound traffic? How does it compare to other local traffic?

A.4 Traditional traffic modeling for telephone calls has been based on Poissonian assumptions, using such formulas as Erlang B and Molina which assume a certain distribution. These are not exactly accurate; they are simply the most convenient models which tend to provide useable results in terms of blocking analysis. Analysis of large numbers of actual telephone calls should show that they tend to have certain modes. A fair number of calls are disconnected within one minute, when the desired party is not there and may or may not leave a brief message. The average duration of calls that actually reach the desired person is reportedly in the 10-15 minute range, though I have not seen exacting studies of current numbers. It should be noted that these gross averages do not distinguish between different categories of caller, such as business vs. residential or adult vs. teenager, which may themselves result in significant differences.

We will assume for the sake of argument, despite the impossibility of really identifying ISP-bound traffic in any sufficiently accurate way, that it is possible to make certain observations about its likely characteristics. On average, ISP-bound calls might well be longer than voice calls. ISP-bound traffic can be expected to have some bimodal characteristics, though. There are very brief calls that disconnect within one minute because authentication fails or the modem connection is inadequate. There are many slightly-longer calls in which the user polls for new mail and then disconnects. And of course there are some long-duration calls wherein a user connects for a lengthy session of web surfing. These, again assuming only for sake of discussion the ability to identify such calls accurately, reportedly may push the average time up to the 20-30 minute range. This of course would vary with the ISP; most American ISPs now operate on a flat-rate basis, but some pay-per-hour service still exits, which will typically have shorter average calls.

It is important to note, however, that aside from such possible call duration differences, there is no material difference between such ISP-bound calls and other local voice calls in terms of network facilities used to carry them, routing, or other objective criteria. There is clearly no known material difference between such ISP-bound calls and other local data calls.

Q.5 With respect to Factual Issue 3, please compare the characteristics of an ISP-bound call and a long-distance call?

A.5 Internet Service Providers are, of course, legally classified as unregulated information services. This is a correct analysis for several reasons. There are major differences between these calls and long-distance voice calls. The latter are not held to terminate at the point where the LEC hands them off to an IXC; they are instead a telecommunications service. Regardless of the fact that IXCs and not ISPs are required to enter "access" arrangements with LECs, the actual flow of information is very different between the two cases.

An IXC's traffic is routed to a destination on a per-call basis. When the originating caller makes a long-distance call, the IXC creates a fixed-bandwidth channel between the originating and terminating local networks. For the duration of the call, at least from the time it is answered, 100% of the information that leaves the originating subscriber goes to the terminating subscriber. None of it goes anywhere else.

In a typical domestic circuit-switched call, the IXC simply provides a 64000 bit per second symmetric bidirectional path between the two networks, effectively creating a 64000 bit per second path between the subscribers. Domestic intercity bandwidth is quite cheap and there is usually no need to compress it. However, long-haul voice calls (but not modem calls) require echo cancellation. This doesn't materially change the audible signal, but does add some degree of real-time signal processing to the path. On most international voice calls, additional processing is needed to convert the 64000 bps representation of a voice call from its North American standard (mu-law) to the European standard (A-law). Overseas calls are also typically compressed to save bandwidth. But this does not change the fact that *all* of the LEC's "access" call bandwidth is dedicated to that call for its duration.

ISP-bound calls are very different. They *terminate* at the modem bank (RAS) of the Internet Access Service Provider (IASP). When a telephone call arrives at the IASP's RAS, the Internet connection is not made immediately. First the modems must "train" with each other to establish what speed the connection is capable of. This can take as long as half a minute. The user must then initiate a link with the RAS using PPP and use one of PPP's authentication options to validate its connection with one or another IVSP. For instance, the user's computer might attempt to log in as "foonly@foo.net" and give a password. The RAS performs an authentication exchange, typically using the RADIUS protocol, with the appropriate ISP's RADIUS server (in this case foo.net's). Only after the username and password combination are validated, and the PPP exchange assigns the caller an IP address, does the caller acquire connectivity to the Internet. Of course the local call has supervised and, if on measured service, begun charging even before the modem-training sequence has begun.

Because the Internet is a packet-switched service, many separate "end-to-end" paths can be active at the same time over a single dial-in call. A user who connects to a commercial web site may, for instance, be receiving data from that web site and simultaneously receive data from a third-party ad server elsewhere on the Internet. And most of the time he may be receiving no data from anywhere. This is all entirely transparent to the LEC network that connects the user to the ISP, and frequently invisible to the end user. The RAS aggregates traffic from a large number of calling modems and forwards it along to whatever its destination may be, which could be in the same room or, via multiple other ISPs, around the world. It does not however forward any knowledge of "telephone calls" except perhaps to the ISP's authentication server. That is in stark contrast to the IXC case wherein the dialed call is the controlling entity at every step of the way.

Thus the "one call" view of ISP traffic is at odds with reality. The ISP-bound call has a complex payload that requires the services of the Internet industry to sort out, with information coming and going on demand from many sources, but often not going anywhere at all. A pre-Internet analogy might be to a local phone call made to a library reference desk; the call is to a single point, but the information may have been gathered over time from many sources. This is very different from telecommunications services which are carried transparently end to end.

Q.6 With respect to factual Issue 3, is it possible to correctly identify each ISP-bound call or Internet-bound call?

A.6 No, for several reasons. Internet Service Providers in the United States are not licensed or regulated. The cost of entry into the business, especially to the key vertical (IVSP) portion, is low, and the cost of exit is also low, as ISPs often merge out of existence. 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.

Indeed, it is in many ways hard to determine just what is the "Internet" and what is not. There is no bright-line boundary between the Internet and other networks. While there are many service providers whose offerings are clearly "Internet" services, other information service providers are not providing "Internet" services.

For example, how does one classify MCI Mail and similar services like AT&T's EZlink? MCI Mail messaging service was initiated in 1982, using a dedicated X.25-based network. It provided internal mail among its own subscribers, later adding a Telex gateway and eventually an Internet mail gateway. Thus it is possible to send email between MCI Mail and the Internet, but if someone is dialed into MCI Mail, are they "on the Internet"? If MCI Mail were "Internet", then what about alphanumeric pagers, many of which are now reachable from the Internet? For that matter, many mobile phones can exchange mail with the Internet. And that begs the question of Wireless Application Protocol (WAP) services, which generally provide filtered low-bandwidth versions of Internet-based content to WAP-enabled handheld cellular phones. There is no clear distinction between Internet services and other services which have some loose connection to the Internet, but do not in any reasonable sense involve ISP-bound calls.

While the Internet is the largest consumer of modem calls today, there are still many other applications of dial-in services. But the other dial-in services with broad geographic footprints rarely operate their own local modem banks. Instead, they contract with service providers who typically also provide access to Internet services using the same dial-in telephone numbers. For example, research firms like Lexis/Nexis and Dialog provide dial-in access to proprietary databases. Making matters more complex, they may have Internet connectivity too, since the Internet provides a widespread inexpensive means of accessing them, but they are not ISPs. A number of these old-line information companies still provide service to paying subscribers.

Then there are also private dial-in modem pools used by corporations, universities, and other large organizations. These provide validated users, not the general public, with connectivity inside their own firewalls, generally for "telecommuting" and roaming-user applications. Sometimes they are just extensions behind PBX systems. Often these private networks also have Internet connectivity, though – what large corporation or university doesn't? But does that make them ISPs? No. Before the days of public ISPs, these accounts were the predominant way by which people accessed the Internet from home. But they are strictly private dial-in facilities.

Some modem pools are shared by multiple subscribers, some of them ISPs, some not. As noted before, there is a large "rent-a-modem" business which allows ISPs (specifically, the "vertical" providers or IVSPs) to outsource their modem access. Not all of the customers of these modems are themselves ISPs, though. Some are non-Internet information services. Some are corporate customers. For example, AT&T Business Internet Services (formerly IBM Global Network) provides corporations with a secure dial-in service. It also provides public Internet service via the *same modem pools and telephone numbers*. But corporate-network callers are not using it to connect to the Internet; generally they are connecting to computers inside their company firewalls. This may be a purely private local data call, not an Internet call, but it can't be distinguished by the dialed telephone number.

Another example of the intermixture of ISP-bound calls and other local data calls is Genuity's DiaLinx service. To quote its brochure, "DiaLinx service is ideal for organizations that want to provide their mobile professionals, telecommuting employees, customers, and business partners with cost-effective remote network connectivity to enhance their productivity." The two cited "customer cases" include a Bristol Hotels, who is using it for links to corporate headquarters, and iPass, a company that provides worldwide dial-in Internet service on a roaming basis to customers of member ISPs. One is clearly using it to provide Internet access, the other clearly not. Yet they are among the customers who share the DiaLinx modem pools.

Nor is it possible to easily find these shared modem pools by telephone number, or to accurately determine from a telephone number whether traffic to the modem pool is ISP-bound, Internet-bound, or local data traffic. Although they may sometimes assign distinct numbers for specific subscribers, especially large ones, who use the same modem pool, rent-a-modem providers usually have telephone numbers shared by many subscribers. These numbers are almost never listed in directories; ISPs frequently list their own local dial-in numbers on their web sites, but some have "unlisted" numbers as well. An ISP might de-list an active number because it plans to discontinue it in the future, so new subscribers will not use it. Or it may have a number with higher priority than others, so that it is not busy as often. Or it may have separate numbers for V.34 modem, V.90

modem and ISDN callers; since ISDN users are relatively rare in the United States, their access numbers might be unlisted but available on request.

Since it is not possible to unambiguously identify ISP-bound calls by the dialed number, can call duration be used instead? This too is inadequate. Non-Internet services may also have long call duration. Voice chat rooms used by teenagers, for instance, can have long holding times, as can many call centers who prefer to keep subscribers in queue rather than provide more agents. Non-Internet data services, such as remote dial-in telecommuting, also tend to have long holding times.

And it is not possible to identify ISPs by the payload of the calls. For one thing, it would presumably constitute an illegal wiretap for a LEC to listen in to modem calls and attempt to decode them. And it might be technically very difficult, because modern modems depend on extremely powerful digital signal processors which perform echo cancellation at each end; standard modem technology doesn't facilitate inexpensive wiretaps in the middle. And even if it were legal and practicable, it would not be unambiguous, because Internet traffic doesn't always look different from non-Internet traffic. Most corporate networks have adopted, or are moving towards adopting, the TCP/IP protocol suite used by the Internet. So the traffic looks the same to a LEC which is carrying a call from an end user to the called number.

Internet-based fax services also warrant consideration. These companies provide fax servers that look to callers like fax machines but which e-mail their inbound faxes to the intended recipients via the Internet. The caller doesn't even know that he's calling an Internet-based service; it is a dedicated application which simply uses the Internet for connectivity. It's hard to call these ISPs but they are *enhanced* services in the regulatory sense. Sometimes, however, these services provide a unified voice mail /fax service *on the same number*. The server distinguishes fax CNG tones from voice and processes each appropriately. On a voice call, the message is digitized, stored and e-mailed to the recipient. Is this an ISP? No. More accurately, I would say that it's a business that uses the Internet as part of its business process.

If simply *using* the Internet makes a business an ISP, then what business today isn't? Should regulation actively discourage businesses from adopting the Internet as a tool, by discriminating against Internet-bound calls?

In short, there is no factual basis for treating Internet-bound calls as anything other than the local calls which they are. There is no unambiguous way of accurately determining specifically which calls are to ISPs or to the Internet and which aren't. Of calls that are actually made for the purpose of using the Internet, most of the actual telecommunications traffic never leaves the modem. These *calls* clearly terminate at the originating modem bank, not at some nebulous distant location. The nature of the data traffic which does leave the modem is very different from that of long distance telephone traffic; Internet service is actually a complex mix of services provided in different places by different players in a still-evolving industry. Thus there is no reliable and accurate factual basis upon which to specifically identify each of these calls, or to avoid mistakes by either excluding calls which should be included in the category or including calls in the category which should not be included. Any intercarrier compensation scheme based on identifying these calls would therefore be inherently inaccurate and discriminatory. In fact, there is no basis on which ISP-bound calls should be treated any differently than other local calls for intercarrier compensation purposes.

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