Moreover, the CLEC is asking the ESPs if they would be interested in offering free Internet access and getting paid for it.

A key benefit to the ESPs from these arrangements with CLECs is that they do not have to establish a POP in each local calling area. They simply establish a single point of connection to the CLEC switch serving the entire area or region.

When the ESP exemption was created, this situation could not have been envisioned. CLECs are able to use interconnection rules to become facilities-based competitors, and combine that with the exemption to gain an unfair and discriminatory market advantage. Under the exemption, ESPs are able to advertise and promote their local telephone numbers for purposes of providing access. IXCs cannot use these arrangements because they legally must buy access services, and to Pacific Bell's knowledge there are no IXCs offering long distance services via this method of access.

Removal of the ESP exemption is a necessary, but insufficient, step to eliminate this problem. The problem will not be alleviated unless there also is some means to enforce the requirement that ESPs purchase appropriate access services. Accordingly, the other necessary step is for the Commission to provide a means (*e.g.*, registration) of recognizing ESPs as unique entities. A means of recognition is needed because it is not possible to distinguish ESP traffic from any other traffic, except by knowledge that the called number belongs to an ESP. Once that means of recognition is in place, either 1) ESPs should not be allowed to promote, advertise, and use local exchange services provided by CLECs for the purpose of providing ESPs with access to Pacific Bell's customers, or 2) calls to ESP telephone numbers should be treated

differently than other calls exchanged between Pacific Bell and CLECs so that Pacific Bell can receive its share of the access revenues (*e.g.*, through meet point billing arrangements or transiting charges). Either way a means of knowing who is and who is not an ESP is needed to enforce the requirements.

ESPs, of course, still would be able to offer service to the CLECs' customers. The CLECs and ESPs[29] could continue to offer competitive choices for all users, supporting Congress's and the Commission's goals to further expand competition. We support that. Moreover, we support reciprocal compensation for interconnection. We do not, however, support interconnection arrangements being used as a means to avoid the use of access services for interexchange access. We do not believe that it was the intent of the Act or the Commission to create a system, based on the convergence of old and new rules, that is allowing several CLECs to become ESP access specialists based on getting better than a free ride on the incumbent LECs' networks. These arrangements prevent the incumbent LECs from having the opportunity to recover their costs and to compete evenly for the ESPs' business.

Removal Of The ESP Exemption Is Legally Required

The ESP exemption creates unreasonable discrimination in favor of ESPs as compared to other access customers and is in violation of Sections 201 and 202 of the Act. The D.C. Circuit upheld the ESP exemption in 1984 against charges that it

[29] Several CLECs are establishing ESP business units of their own.

created unreasonable discrimination because it was a "graduated transition" that caused only "slight rate disparities," not a permanent exemption that creates substantial disparities in payments. [30] We are confident that the D.C. Circuit would conclude differently now that the exemption 1) has been in place 13 more years without any "graduated transition" to remove discrimination, 2) exempts ESPs, which have become part of a huge industry and some of which are multi-billion dollar corporations, from payment of hundreds of millions of dollars in charges that other customers pay every year, and 3) provides ESPs with the incentive to use carriers' networks inefficiently.

Reform Is Needed Now

The ESP exemption is retarding development of the next wave of Internet growth and the benefits which that growth would bring to consumers. The Commission should take action now to remove the price control of the ESP exemption and allow data solutions to emerge -- only this Commission has the national scope and mandate to ensure that this will happen. Removal of this price control will release investment to build a fast-packet data network (a necessary part of the Information Superhighway) in order to realize the Internet promise -- ubiquitous, fast access to information, entertainment, and people.

[30] *NARUC v. FCC*, 737 F.2d 1095, 1137 (D.C. Cir. 1984).

III. THE TECHNOLOGICAL CHALLENGE

The Commission requests "data on the characteristics of information service usage and its effects on the network."[31]

A. Dial-Up Internet Usage Is Large And Growing

We discuss the rapid growth of dial-up Internet traffic in Pacific Bell's territory in Section II A. above and in Section 3 of the White Paper in Exhibit A. In order to better understand the impact of this rapid growth on the public switched network, we assessed a variety of data sources, including a two-week traffic study of dial-up Internet use at 38 randomly selected switches supporting ISP POPs throughout Pacific Bell's territory.[32] Key findings include:[33]

- 30% of the total minutes-of-use ("MOU") generated by dial-up Internet traffic comes from calls lasting 3 hours or more, and 7.5% come from calls lasting 24 hours or more. The average voice call lasts about 4 to 5 minutes.
- The average MOU per ISP line per day is 675 -- or, 45 MOU per user per day[34] This average is approximately double the voice residential average of 22 MOU per user per day.

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[31] NOI at para. 315.

[32] Pacific Bell's study included 880,000 calls (both residential and business) to ESPs. Thus, contrary to the assertion of the January 22, 1997 Selwyn/Lazlo Internet Use Study (p. 19), Pacific Bell's study did not rely on "...isolated, worst-case situations in which the specific central offices were selected for examination...."

[33] *See* White Paper at 6, Exhibit A.

[34] This is at a concentration ratio of 15-to-1. "Concentration ratio" refers to the number of dial-up customers per ISP line.

B. Internet Traffic On The Public Switched Network Raises Congestion Issues

These findings from our study demonstrate a number of important points. 1) High Internet usage is not isolated to a few switches in a few central offices; it occurs generally. 2) A small percentage of the users are generating the great majority of minutes of use.[35] 3) The substantially longer average customer use and longer sessions of Internet usage, as compared to voice usage, indicate that, as more people subscribe to Internet access services, usage on the voice network will likely mushroom. The use of the network for Internet traffic could swamp its use for voice traffic if the Internet becomes a successful "mass media" vehicle (e.g., Web TV). The rapid growth in usage will greatly increase the challenge of avoiding congestion problems and will require large investments in the existing voice network to support packet Internet traffic, clearly not the path towards an Internet future envisioned by policy makers.

Heavy and unpredictable usage patterns of Internet traffic cause network congestion on the public switched network because local switching offices were not engineered for this type of traffic. They were engineered to accommodate the predictable usage patterns of voice traffic. For instance, business customers typically incur heavy usage during the day with the average call lasting about 5 minutes. Residential customers usually incur heavy usage during the early evening with the average call lasting about 4 to 5 minutes. These patterns allow Pacific Bell to predict

[35] This point is supported by the January 22, 1997 Selwyn/Lazlo Internet Use Study at p. 26 ("On average approximately 10% of ESP users account for between 60% and 70% of total ESP hours of use.")

the amount of network resources required and expand the public switched network efficiently by sharing network resources among different types of customers.

Although our traffic study indicated that the dial-up Internet peak busy-hour is typically around 10 to 11 p.m., this pattern is inconsistent. Examples of congestion in Pacific Bell's territory show that the Internet peak busy-hour is less predictable than the residential voice peak busy-hour. The peak Internet hour has fluctuated dramatically between late afternoon and late evening,[36] while the peak residential voice hour has been found to be consistently around 7 p.m. Since the Internet busy hour range includes the normal residential voice busy hour, they would sometimes occur at around the same time period and push the peak-usage of switches upward, increasing the likelihood of congestion problems and increasing LEC costs by requiring expansion of capacity. Moreover, Internet traffic itself can establish the busy hour. For instance, in late 1996, the busy-hour of a central office in Silicon Valley moved from the hour of 2:30 to 3:30 p.m. to the hour of 8:00 to 9:00 p.m., a six-hour shift driven by Internet rather than voice traffic.[37] As Internet traffic continues to grow on the PSTN, this traffic will have an ever increasing effect on peak-usage with corresponding cost increases.

The White Paper in Exhibit A explains step-by-step and graphically how Internet traffic upsets the efficient sharing of network resources and causes network congestion in three key network areas resulting in the need for immediate upgrades to

[36] White Paper at 11-14, Exhibit A.
[37] *Id.* at 11-12, Exhibit A.

network resources, including: lines, trunks, and inter-office facilities.[38] These upgrades are necessary not only to accommodate Internet traffic but also to protect traditional voice telephone users.

C. The Extent Of The Congestion Problem Is Broad

Congestion is not isolated to a few central offices. Like Internet traffic in general, congestion is widespread and growing. Of the 772 switches in Pacific Bell's network, approximately one-third serve ESP nodes and are therefore vulnerable to congestion. Between March, 1996 and January 1997, 62 of these switches have experienced Internet congestion -- they have exceeded normal network thresholds, and performance has been degraded below network standards. Congestion increased dramatically at the end of 1996 when America Online introduced flat-rate pricing. From December of 1996 through January of 1997, the number of Pacific Bell switches having traffic exceeding normal network thresholds increased from 26 to 62.

The White Paper in Exhibit A provides details on three examples of congestion in various parts of Northern California, ranging from "Internet-rich" Silicon Valley, an office in a suburb of the east Bay Area, and a small rural office in northeast California. Fifty-nine other examples could be illustrated.[39] The examples demonstrate that Internet congestion is not a theoretical or isolated problem. It has real and widespread effects on Pacific Bell's facilities and normal voice customers and will not

[38] *Id.* at 9-10, Exhibit A.
[39] *Id.* at 11-14, Exhibit A.

subside so long as the ESP exemption allows ESPs to avoid paying for use of the telephone network.

IV. THE ECONOMIC CHALLENGE

The Commission "is particularly interested in data on the incumbent LECs' costs directly related to ESPs' use of the PSTN, [and] on incumbent LECs' revenues attributable to ESP traffic (including second line revenue)...."[40]

The uneconomic behavior caused by the ESP exemption -- use of the voice network for huge quantities of data -- creates an equally irrational economic environment for Pacific Bell -- incremental Internet revenues do not cover incremental costs. More specifically, the costs to upgrade the voice network to support both ESP traffic and second-lines for end-users (especially where there are insufficient loop facilities) are greater than the combined revenues from both ESPs' purchases of services to connect to the local network and end-users' purchases of additional lines to connect to the switch.

A. Internet Service Provider ("ISP") Traffic Creates Costs That Exceed Revenues

Pacific Bell earns installation and flat-rate revenues on the business services ESPs lease to allow their end-users to interconnect with their POPs. These services are typically line side connections,[41] although migration to PRI ISDN services

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[40] *NOI* at para. 315.

[41] Normal business lines (1MB and Centrex) account for over 70% of ESP connections in Pacific Bell's territory.

is growing.[42] Pacific Bell also incurs incremental capital and expense associated with upgrading the central office lines, trunks, and inter-office facilities necessary to accommodate ISP dial-up Internet traffic.[43]

Using conservative assumptions for dial-up Internet growth,[44] Pacific Bell will generate about $150 million in incremental revenue from ISPs, but spend over $300 million to support ISP traffic over the next 5 years.[45] These are misdirected funds. Public policy should not be encouraging use of the voice network by ISPs for massive Internet traffic, resulting in hundreds of millions of dollars in scarce capital being invested in the voice public switched network. Rather, ISPs should be encouraged to use data networks so that investment will be directed there, resulting in the deployment of packet-data networks that will provide the basis for the more advanced, future data Internet.

B. End-User Internet Traffic Creates Costs That Exceed Revenues

Pacific Bell earns installation and flat-rate lease revenues on additional residential lines purchased for access to the Internet. Some *usage* revenue for local calls is also earned on additional and primary lines, but is very limited because the vast

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[42] Over 1500 ISDN Primary Rate ("PRI") Services are on order, an equivalent of 34,500 lines. Each PRI facility is equipped to handle 23 or 24 circuits (in most cases one circuit is required for signaling). As with 1MBs, no usage charges are generated for terminating traffic over PRI lines.

[43] *See* White Paper at 9-10, Exhibit A.

[44] *See id.* at 5, Exhibit A.

[45] See *id.* at 17, Exhibit A.

majority of residential lines used for Internet access in Pacific Bell's territory are flat-rate residential lines (approximately 80%).[46]

Pacific Bell also earns installation and flat-rate lease revenues on additional business services purchased for dial-up access to the Internet. These subscribers are typically those business locations which do not have the need for dedicated connections to their ISP. Unlike most residential lines, Pacific Bell does earn usage revenues on local calls made by these business end-users. However, the majority of dial-up subscribers to the Internet are residential, not business, customers (again, about 80%).

On a regular flat-rate residential voice line (1FR), a large part of Pacific Bell's average monthly revenue comes from usage charges (e.g., toll and switched access fees from long distance calls) or features (e.g., call waiting). On a line used only for dial-up Internet access, however, revenues for usage and features are not generated. The flat-rate charge does not nearly cover the average monthly cost per 1FR.[47]

Pacific Bell incurs substantial incremental local loop costs associated with installing and maintaining additional residential and business end user lines used for dial-up Internet access. This cost is primarily driven by the additional facilities necessary to meet demand -- about 35% of additional-line requests require installation

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[46] Pacific Bell does not receive usage revenue for local calls made by the residential customer to an ISP's POP regardless of the frequency or duration of the calls. *See id.* at 18 & n.19, Exhibit A.

[47] *See id* at 18-20, Exhibit A.

of facilities. Pacific Bell conducted a detailed study on the net-present value of supporting Internet service providers' traffic on the voice network and deploying additional lines used only for Internet access. The study concluded that, on a discounted cash-flow basis, supporting Internet traffic on the PSTN will create approximately $440 million in negative net-present value over the next ten years.[48] There is no economic rationale for locking in this subsidy by Pacific Bell for ESPs' use of the circuit switched network. If this subsidy that is created by the ESP exemption is removed, network services will be provided on an economically rational basis, and data traffic will be encouraged to move from the voice network to data networks which can handle the traffic more efficiently.

V. THE DATA SERVICES CHALLENGE

The Commission "invite[s] parties to identify means of addressing the congestion concerns raised by incumbent LECs, for example by deploying hardware to route data traffic around incumbent LEC switches, or by installing new high-bandwidth access technologies such as asymmetric digital subscriber line (ADSL) or wireless solutions."[49]

A. "Building It" Is Not Enough

Some have suggested that the answer to the dilemma of encouraging the movement of Internet traffic from the congested public switched network to data

[48] *See id.* at 20-21, Exhibit A.
[49] *NOI* at para. 313.

networks might be to "build it and they will come." In this case, the "it" is a new fast packet data network service especially intended for use by Internet Access Providers, and we are, in fact, working on such services. However, the availability of the services will not be enough. ESPs must be given the incentive to move from the existing access arrangement to the new services, and removal of the ESP exemption is just the incentive that is needed now.

Developing new services is not enough for several reasons. First, because it takes time to design, engineer, and deploy new services, we will continue to pour money into expanding the public switched network to accommodate the growth in ESP traffic, and without the receipt of ESPs' access charges, we will have to do so without receiving compensation to cover the costs.

Second, we do not expect all ESP traffic to move off the public switched network even when the new fast packet data services are in place. In less populated areas, ESPs may continue using the public switched network for years, and a cost-based rate structure is needed so that ESPs pay the costs they cause in those areas.

Third, the costs of developing and deploying the new technologies needed for data networks will include those costs that are driven by usage. These usage costs are a significant percentage of the overall costs. It is wrong to think that these new technologies can "compete" in price with the current local business service arrangement, which does not include any usage pricing component. Of necessity, the new technology will be more costly. Offering this technology at today's prices is not, as

some have suggested, a solution. It would merely shift the subsidy from the current arrangement to a new one, and the subsidy would be even larger and would continue to grow.

So long as the lower priced and subsidized business service is available, most ESPs are likely to continue to use it. In a competitive market, it is very difficult for a competitor to give up a subsidy, even in exchange for a better service. The competitor knows that many of the providers with which it competes will continue to take the subsidy and under price it in the market. Thus, if we price the new services economically, we believe that ESPs will be strongly discouraged from using them. If, however, we were to price economically for their type of use the current services that ESPs use, then they would be given the incentive to move to new services, providing them and us with greater economic benefit, including an increase of resources available for future network development and expansion.

In summary, the answer to the problem of encouraging the development of the enhanced service industry is not to build, and then give away, a new network in order to reduce the losses from the old network. Even if the call was "give it away, and they will come," the subsidy debt would only continue to grow. Use of the new subsidized network might expand, but ESPs would have no incentive to move to even better networks, unless someone gave those away too. The answer must be the same as it has always been for successful and healthy economic development -- let the cost-causers pay the costs, and let competition in the marketplace and consumer demand determine the winners and losers.

B. Development, Deployment, And Use Of New Data Access Service Solutions Are Of Key Importance

Pacific Bell is developing service solutions to provide users with higher-speed, more reliable Internet access and to alleviate congestion on the PSTN by encouraging the movement of Internet traffic from the voice network to a much more efficient data network. We briefly describe two examples of these services here and provide more details in Section 6.2 of Exhibit A.

Data Access Gateway Will Help Reduce Internet Traffic On Parts Of The PSTN

A Data Access Gateway ("Access Gateway") solution is expected to be available in parts of Pacific Bell's territory in mid-summer 1997, pending successful technology tests and regulatory approvals. This solution will provide a new network access and transport service for use with Internet access by ISPs and remote Intranet access customers (e.g., corporate telecommuters). The Access Gateway will establish, manage, and maintain local access links for ESPs. It will combine T1, PRI ISDN, modem pool, router, and Frame Relay interface functions into a single offering.

The Access Gateway is being developed to provide a number of benefits. For end users, the benefits are expected to be more reliable interconnection to ISPs, wider availability of Internet access because of wide geographic access to the Access Gateway, and more robust Internet products and services. Corporate end users also will benefit from remote LAN and host-site access to the Access Gateway and from the Access Gateway being an alternative to expensive dedicated facilities. ISPs are

expected to benefit from 1) reduced capital and operating expenses from reduced purchases of modems and other equipment, 2) improved network efficiency and reliability, and 3) lower risks from expansion into new territories because of faster time to market and more flexible ability to adjust network requirements to customer demand. Finally, the Access Gateway is being developed to encourage the movement of Internet traffic off much of Pacific Bell's voice network (primarily the terminating and tandem switches and associated inter-office trunking), in order to relieve congestion and provide a better foundation to support higher-speed Internet access growth. *See* Section 6.2 of Exhibit A for more details concerning these potential benefits.

xDSL Will Help Reduce Internet Traffic On All Of The PSTN

Pacific Bell is a strong supporter of xDSL technologies[50] as the next generation of high-speed access. Pending successful results of technology testing and regulatory approvals, xDSL access technology will utilize the existing copper loop infrastructure in Pacific Bell's territory and provide dramatically faster Internet access speeds than are currently available.

Like the Access Gateway, xDSL is being developed to provide benefits to end users, ISPs, and the PSTN. Expected benefits for end users will include higher speed access and use of a single line. Corporate end user's will benefit from connectivity at lower overall costs as compared to using existing dedicated services. xDSL is being developed to provide ISPs a significantly higher-speed service to offer

[50] "xDSL" is a generic term for a range of Digital Subscriber Line technologies, including ADSL and HDSL.

their residential end users. The PSTN will benefit from xDSL's complete bypass of the PSTN, which will help encourage the movement of data traffic off the congested voice network. *See* Section 6.2 of Exhibit A for more details concerning these benefits.

The key to obtaining these benefits is regulation that supports the economic use of network services so that new, advanced services will not have to compete in price with heavily subsidized, traditional services. Accordingly, the Commission should quickly remove the ESP exemption from access charges.

VI. CONCLUSION

The Commission should remove the ESP exemption from access charges without delay and take the other steps we have discussed above in order to remove price controls and unleash the investment needed to build fast-packet data networks. This will allow the next wave of information services growth and the realization of the Internet promise to bring ubiquitous, fast access to information for all members of society and increased economic growth for our nation.

Respectfully submitted,

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Date: March 24, 1997

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EXHIBIT A

Comments by Pacific Telesis Group
March 24, 1997

Surfing the "Second-Wave"

Sustainable Internet Growth and Public Policy

Pacific Telesis Group

March 24, 1997

www.pactel.com

Surfing the "Second-Wave"

Sustainable Internet Growth and Public Policy

March 24, 1997

1.0 Executive Summary

Pacific Telesis Group (PTG) supports the robust growth and availability of the Internet. We believe the Internet is a key part of the Global Information Infrastructure (" Information Superhighway") and essential to the economic vitality of the United States. As such, we will continue to push development of this important new communications channel through our Pacific Bell, Nevada Bell, Pacific Bell Internet Services, and Pacific Bell Network Integration subsidiaries.

Explosive growth in dial-up Internet traffic in California is creating enormous opportunities and challenges for Pacific Bell.[1] The Internet is a major new communication channel in Pacific Bell's territory, commanding an increasingly large part of end-users' total usage and driving large investments in the public switched telephone network (PSTN). Pacific Bell believes this traffic should be carried in a more technologically and cost-efficient manner over packet-data networks[2] and has several efforts underway to develop data solutions.

However, two key regulatory issues must be addressed to support and accelerate the development of these high-speed packet-data networks. First, the Enhanced Service Provider (ESP) exemption must be eliminated to encourage Internet Service Providers (ISPs) to move Internet traffic off the PSTN; second, the development of data access technologies must not be burdened with regulations developed and intended for the current voice telephone market.

This "whitepaper" was developed to describe the Internet's impact on Pacific Bell's existing voice telephone network and articulate product and regulatory actions essential to jump-starting the "Second-Wave" of Internet growth. Key points of the whitepaper include:

Internet penetration and growth is very strong in Pacific Bell's California territory. *(section 2.1)*

- At year-end 1996, there were an estimated 2.3 million total dial-up Internet users in Pacific Bell's territory (both residential and business users). By 2001, using conservative assumptions for Internet growth, dial-up users will grow to 4.7 million - even after allowing for the migration of users to new technologies such as digital subscriber line (e.g., xDSL[3]) and cable modems.

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[1] "Dial-up" Internet traffic uses the public switched telephone network to connect to Internet Service Providers (ISPs); "dedicated" Internet traffic uses private facilities to connect to ISPs. "Internet traffic" refers to connections made directly to ISPs and online services (e.g., AOL).

[2] "Packet-data" refers to a variety of technologies that send "packets" of data over networks at various transmission speeds. Unlike circuit-switched networks (i.e., voice telephony networks), which can support only one call per circuit per unit of time, packet-data networks can support many messages simultaneously and at speeds ranging from 56 Kbps to over 600 Mbps. For data traffic like that of the Internet, packet technology is far superior to circuit-switched voice.

[3] "xDSL" is a generic term for a range of Digital Subscriber Line technologies, including ADSL, HDSL.

- In 1995 and 1996, Pacific Bell's territory had the highest online household penetration rate of any Regional Bell Operating Company (RBOC); in 1996, Pacific Bell's penetration rate was almost 33% higher than the next highest RBOC.

Dial-up Internet traffic volumes on Pacific Bell's voice network are significant. *(section 2.2)*

- 30% of the total minutes-of-use (MOU) generated by dial-up Internet traffic come from calls lasting 3 hours or more and 7.5% come from calls lasting 24 hours or more. The average voice call lasts about 4 to 5 minutes.

- The average MOU per ISP dial-up line per day is 675 - or, 45 MOU per user per day at a concentration ratio of 15-to-1. This average is about double the voice residential average of 22 MOU per line per day.

- In 1996, residential Internet dial-up traffic flowing through Pacific Bell's voice network accounted for 27% of total residential traffic. Using conservative assumptions for Internet dial-up traffic in 2001, there will be almost as much residential Internet dial-up traffic as voice traffic.

This Internet traffic has had a substantial, widespread impact on Pacific Bell's network. *(sections 3.1 and 3.2)*

- Of Pacific Bell's 772 switches, approximately one-third act as ISP hubs concentrating Internet traffic.
  - ⇒ The greatest impact to the voice network has been on central offices serving those ISP points-of-presence (POPs).
  - ⇒ As of January 1997, 62 had already exhibited congestion - i.e., where voice switch performance has been degraded below network standards.
  - ⇒ This number has grown significantly over the past few months - in October 1996, only 3 months before, there were 23 switches that had exceeded network performance congestion levels.

- In cases of congestion, Pacific Bell must quickly augment its network to maintain voice network performance standards - *in 1997 incremental costs for this augmentation are estimated to be over $100 million.*

Because of current regulatory policies, this phenomenal growth (which should be unambiguously applauded by all industry participants) has an overall negative economic impact on Pacific Bell. *(sections 4.0 and 5.0)*

- 10 year net cash flows (discounted) are projected to be <$441M>. This is driven by:

  - ⇒ The ESP exemption which subsidizes ISPs and results in Pacific Bell receiving no usage revenue for investments made to support increased Internet traffic terminating at an ISP POP.

  - ⇒ A pricing structure in California for end-user telephone line rental (e.g., for a second-line used in a household for Internet use) where line rental revenue is less than the cost of providing it. This situation is exacerbated by a recent California Public Utilities Commission decision that specifically excluded second-lines from receiving any help from the Universal Service Fund - which was created to remedy this very 'line rental subsidy' situation.

Despite these obstacles, Pacific Bell is pursuing a number of solutions that support moving Internet packet traffic off its voice network and onto a more efficient, higher speed and quality packet-data network. Moving to a packet-data network is the foundation of the long-term future of the Internet. *(section 6.0)*

- These products would offer a wide range of access speeds, from today's 28.8 Kbps to 1.5 Mbps over existing copper loop technologies.

To accelerate the development of these packet-data networks, Federal and State regulators must take positive action immediately. *(section 7.0)*

- The ESP exemption must be eliminated and replaced by a modest usage fee that will provide the proper motivation to move from today's (subsidized) voice network to a data network. At the current (subsidized) average rate of $0.00073 per MOU (seven one hundredths of a cent), there is simply no motivation for ISPs to move traffic off the PSTN. Even extremely aggressive "forward pricing" for products like Access Gateway will still be multiples above the almost free ESP price.

  ⇒ At a $0.01 per minute access fee, 80% of dial-up Internet users would pay less than $5 additionally per month.

- Complicated and restrictive regulatory structures intended for current voice products (e.g., little or no pricing flexibility) must not be applied to new packet-data access products; these new products are completely competitive today - layering old regulatory schemes will only retard their introduction.

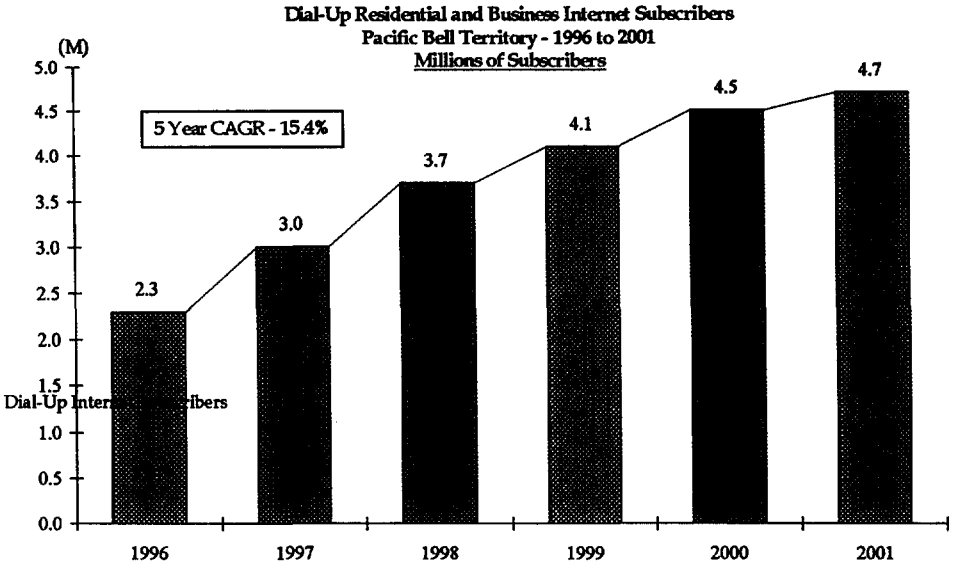
In summary, Pacific Bell believes there are solutions to the critical issues addressed in this whitepaper. These solutions must be built and supported by all industry participants - business, regulators, end-users. **Failure to resolve these fundamental issues in an economically rational manner for all Internet service suppliers - including RBOCs - will significantly slow the creation of the Internet's "Second-Wave."**

2.0 Internet Growth and Usage in the Pacific Bell Territory

2.1 Dial-Up Internet Growth

The Internet has quickly emerged as a major new communications vehicle in California. At year-end 1996, there were an estimated 2.3 million total dial-up Internet users in Pacific Bell's territory.[4] By 2001, using conservative assumptions for Internet growth[5], dial-up users will grow to 4.7 million - even after allowing for the migration of users to new technologies such as digital subscriber loops (e.g., xDSL[6]) and cable modems. (Figure 1)

Figure 1



Source: Veronis, Suhler; Yankee Group; Jupiter Communications; Pacific Telesis Estimates

Pacific Bell has been more heavily impacted by dial-up Internet traffic than other RBOCs. In 1995 and 1996, Pacific Bell's territory had the highest online household penetration rate; in 1996, Pacific Bell's penetration rate was almost 33% higher than the next highest RBOC. (Figure 2)

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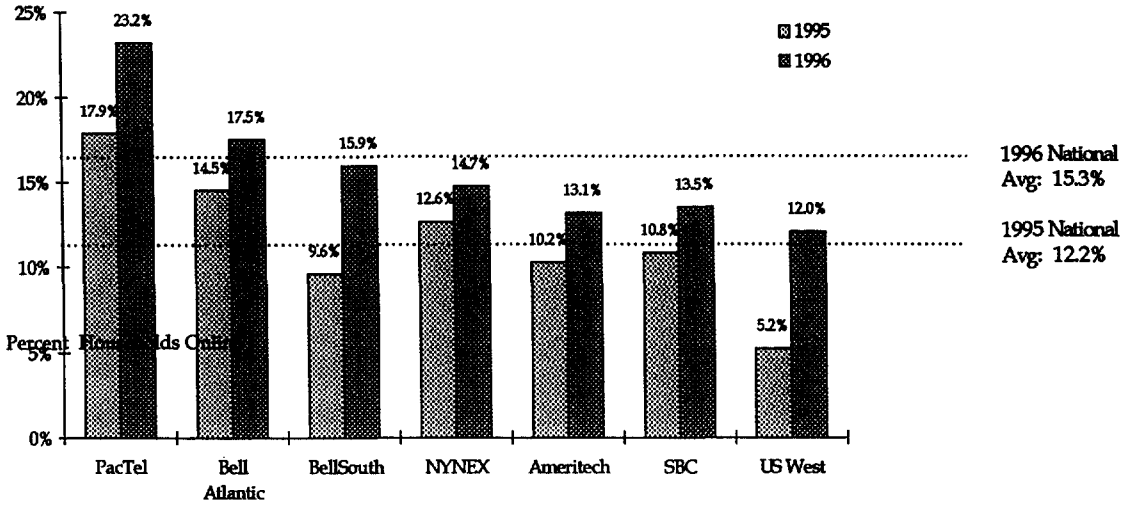
[4] Includes both residential and business dial-up customers.

[5] Assumes year-over-year growth rates of 32% in 1997, 20% in 1998, 11% in 1999, 8% in 2000 and 5% in 2001 - a 15.4% compounded annual growth rate (CAGR). The actual CAGR from 1993 to 1996 exceeded 70%.

[6] "xDSL" is a generic term for a range of Digital Subscriber Line technologies, including ADSL, HDSL.

Figure 2

Online Household Penetration by RBOC Territory



Source: Yankee Group TAF Survey, 1995 and 1996; Pacific Bell actuals for 1996

Although California is currently at the front of the Internet wave, every RBOC will eventually face the same challenges and opportunities as Pacific Bell, even if conservative projections of continued robust Internet growth are accurate.

2.2 Dial-Up Internet Usage

To better understand the impact of this dramatic growth in dial-up Internet traffic on the PSTN, Pacific Bell conducted a two-week traffic study of dial-up Internet use at 38 randomly selected switches supporting ISP access nodes (POPs) throughout Pacific Bell's territory. The study collected detailed information from 880,000 dial-up Internet calls (both residential and business). Key findings from this study include:

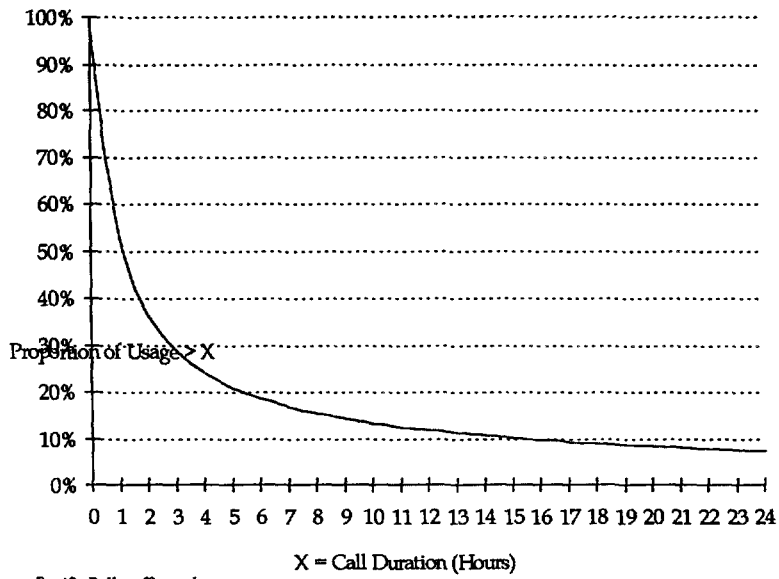
- 30% of the total minutes-of-use (MOU) generated by dial-up Internet traffic come from calls lasting 3 hours or more and 7.5% come from calls lasting 24 hours or more. The average voice call lasts about 4 to 5 minutes. (Figure 3)

- The average MOU per ISP line per day is 675 - or, 45 MOU per user per day at a concentration ratio of 15-to-1.[7] This average is about double the voice residential average of 22 MOU per line per day.

[7] "Concentration ratio" refers to the number of dial-up customers per ISP telephone line.

Figure 3

Internet Dial-Up Usage Patterns - Proportion of Usage by Call Duration

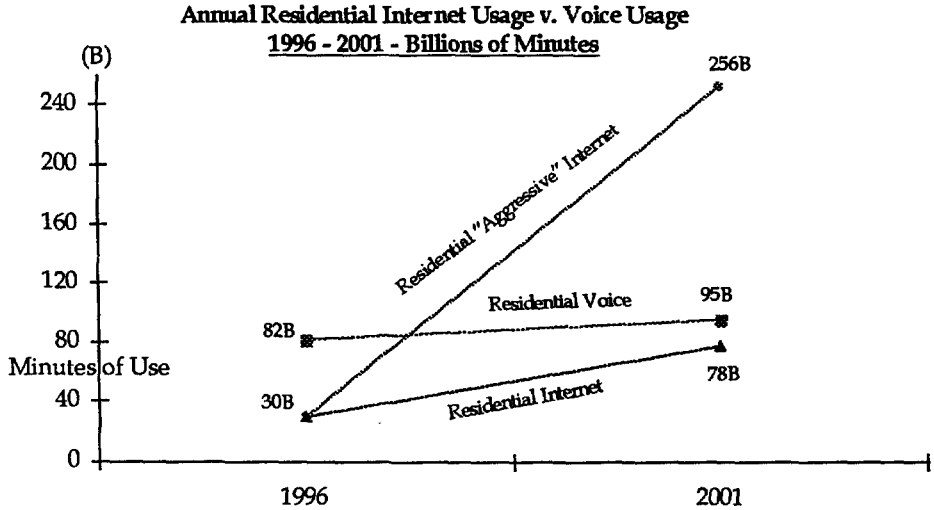


Source: Pacific Bell traffic study

The magnitude of the Internet's impact on Pacific Bell's voice network is dramatically illustrated by comparing the total MOU generated by dial-up residential Internet subscribers with the MOU generated from residential voice users. (Figure 4).

Figure 4

Annual Residential Internet Usage v. Voice Usage
1996 - 2001 - Billions of Minutes



Source: Pacific Bell traffic study; Veronis, Suhler; Yankee Group; Jupiter Communications; Pacific Telesis Estimates