

ORIGINAL

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NOV 23 1998
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

November 23, 1998

BY COURIER

Magalie R. Salas, Esq.
Secretary
Federal Communications Commission
445 Twelfth Street, SW
12th Street Lobby, TW-A325
Washington, DC 20554

Re: **CC Docket No. 98-184**

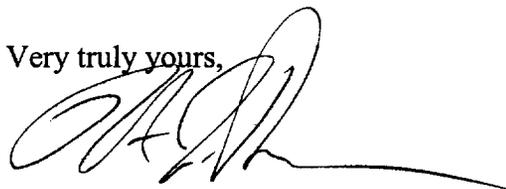
Dear Ms. Salas:

On behalf of WorldPath Internet Services, enclosed for filing is an original and four copies of its Comments in the above-referenced docket.

Also enclosed is an extra copy of these Comments. Please date stamp the copy and return it in the enclosed envelope.

If you have any questions, please contact me.

Very truly yours,



Morton J. Posner

Counsel for WorldPath Internet Services

cc(w/encl.): Janice Myles
Michael Kende
To-Quyen Truong
ITS

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**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

RECEIVED

NOV 23 1998

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
GTE CORPORATION,)
Transferor,)
and) CC Docket 98-184
)
BELL ATLANTIC CORPORATION,)
Transferee,)
)
For Consent to a Transfer of Control)

COMMENTS OF WORLDPATH INTERNET SERVICES

WorldPath Internet Services ("WorldPath"), by counsel, hereby submits its Comments in opposition to GTE Corporation's ("GTE") proposed transfer of control to Bell Atlantic Corporation ("BA"). WorldPath is one of New Hampshire's first and largest full service Internet Service Provider, serving from Southern New Hampshire to Concord and Laconia to the White Mountains and into Western Maine. WorldPath is based in Farmington, New Hampshire where, as it does in other portions of the state where Bell Atlantic - New Hampshire ("BA-NH") is the incumbent local exchange provider, it purchases tariffed retail BA-NH products to service its own end user customers. As a large Bell Atlantic retail customer in many New Hampshire communities, WorldPath is concerned about the effect that a Bell Atlantic-GTE merger may have on telecommunications customers.

As described in the attached correspondence accompanying these Comments, BA-NH had difficulty meeting the traffic demands on its Farmington, New Hampshire Central Office switch beginning around the summer of 1997. Due to the inadequacy of the Farmington switch, high traffic congestion eventually led to significant dial tone delay, endangering the public safety of Farmington

and nearby communities. This lack of BA-NH switching capacity also resulted in BA-NH frequently blocking WorldPath end users' calls to WorldPath's dial up lines.

Despite the fact that WorldPath submitted accurate demand forecasts to BA-NH for BA-NH services in the spring of 1997, BA-NH consistently failed to address the inadequate capacity of its Farmington switch. Ultimately, traffic congestion caused by BA-NH's inattention got so bad that BA-NH cut 24 of 96 lines WorldPath purchases from BA-NH on an hour's notice on January 28, 1998, and refused to honor an overdue order for an additional 24 lines. Only after WorldPath obtained the assistance of the New Hampshire Public Utilities Commission's Staff did BA-NH restore service to WorldPath, yet not fast enough to minimize WorldPath's business losses caused by the unannounced service disruption. No local exchange carriers compete with BA-NH in the Farmington exchange. A BA-NH affiliate is an Internet Service Provider which competes with WorldPath in New Hampshire.

At a time when local competition against Bell Atlantic has failed to get traction in any meaningful sense, Bell Atlantic seeks to cement its already firm monopoly by absorbing the nationwide resources of GTE. Such a combination will not help open local markets to competition. As a result, WorldPath and other local exchange customers can expect a continuation of poor Bell Atlantic service and rates, slow repairs, unannounced service outages, and inadequate facilities. In addition, the combined Bell Atlantic-GTE will be able to leverage its local monopoly for the benefit of its Internet Service Provider affiliate. According to the Bell Atlantic-GTE Application, GTE Internetworking is the fourth largest Internet backbone provider in the country. GTE Internetworking is also one of the largest dial up Internet providers in the nation, with a subscriber

base in the third quarter of 1998 of 600,000 customers.^{1/} This base grew by 200% last year.^{2/} In the end, consumers will have fewer choices in the local exchange and Internet Service markets, rather than more.

For the above reasons, WorldPath urges the Commission to reject the proposed transaction.



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Counsel for WorldPath Internet Services

Dated: November 23, 1998

^{1/} <http://www.gte.com/AboutGTE/news/ISPs.html> (visited Nov. 19, 1998).

^{2/} <http://www.gte.com/g/news/980528.html> (visited Nov. 19, 1998).

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
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GTE CORPORATION,)
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)
BELL ATLANTIC CORPORATION,)
Transferee,)
)
For Consent to a Transfer of Control)

AFFIDAVIT OF MORTON J. POSNER

I, Morton J. Posner, being duly sworn, depose and say as follows:

1. I am an attorney for WorldPath Internet Services of Farmington, New Hampshire.
2. Attached to this Affidavit are true copies of January 30 and April 20, 1998 letters I sent to the New Hampshire Public Utilities Commission ("N.H.P.U.C.") on behalf of WorldPath regarding a January 28, 1998 disconnection of 24 of its lines.
3. Also attached to this Affidavit is an April 3, 1998 letter I received from Bell Atlantic-New Hampshire regarding the disconnection, and February 25 and May 18, 1998 letters I received from the N.H.P.U.C. concerning the matter.



Morton J. Posner

Sworn and subscribed before me this 20th day of November, 1998.



Notary Public

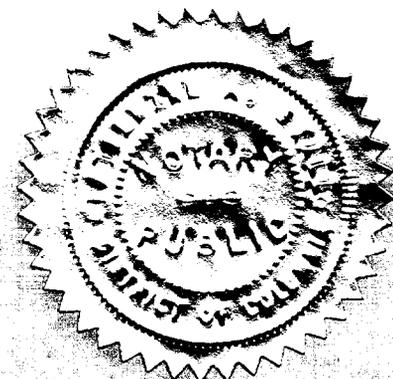


EXHIBIT A

SWIDLER
&
BERLIN
CHARTERED

January 30, 1998



BY FACSIMILE AND FEDERAL EXPRESS

Chairman Douglas L. Patch
Commissioner Susan S. Geiger
Commissioner Bruce B. Ellsworth
New Hampshire Public Utilities Commission
8 Old Suncook Road
Concord, NH 03301

Re: Bell Atlantic Disconnection of WorldPath Internet Services Lines

Dear Commissioners:

On behalf of WorldPath Internet Services ("WorldPath"), we request an investigation of Bell Atlantic-New Hampshire's ("BA") recent disconnection of WorldPath lines purchased from BA and BA's chronic and notorious service failures at its Farmington Central Office.

WorldPath is an Internet Service Provider serving customers in the Farmington area with approximately 100 business telephone lines it purchases from BA under tariff. Its BA account is current and not in arrears. On the evening of January 28, 1998, BA disconnected 24 WorldPath lines. One hour before disconnection, BA notified WorldPath by telephone that it intended to disconnect WorldPath lines. BA followed up this oral notification with a fax to WorldPath listing the 24 telephone numbers it had disconnected. WorldPath had no other advance notice of the disconnection. Currently, there is no dial tone on the lines in question and callers to those numbers receive a busy signal.

Because of the disconnection, WorldPath was unable to meet its normal demand for Internet access from its customers that evening and WorldPath customers experienced busy signals. WorldPath was similarly unable to serve all of its customer demand on January 29, 1998 and expects the same situation today. As a result, WorldPath has lost revenues and the goodwill of its customers. In addition, WorldPath expects to lose the monthly access fees of those customers who experience difficulty reaching WorldPath and seek refunds under the company's service guarantee.

WorldPath attempted to gain an explanation from BA throughout the day on January 29 and the morning of January 30 as to why its service was disconnected on such short notice. Only after separate calls with BA's regulatory counsel and Commission Staff this afternoon did we become aware that BA was considering a temporary rerouting for 24 WorldPath lines through another Central Office, but such a measure would not put WorldPath's 24 lines back into service until Tuesday, February 3. Even if such an interim solution is possible, it neither puts WorldPath's lines

**Chairman Douglas L. Patch
Commissioner Susan S. Geiger
Commissioner Bruce B. Ellsworth
January 30, 1998
Page 2**

back into service fast enough to minimize our business losses, nor totally solves the problem of switch congestion preventing WorldPath customers from reaching the company on any of its other 72 Farmington lines. In short, BA cannot remedy the outage unless it attempts to coordinate a solution with WorldPath, which BA has not done.

BA has been aware of inadequacies in the capacity of its Farmington switch for the last six months. Indeed, in the spring of 1997, WorldPath provided BA with a demand forecast for BA lines which has proven accurate. BA has utterly failed, however, to take steps to meet that demand. During the last six months, WorldPath has complained repeatedly to BA that WorldPath customer calls to the company have been blocked on a consistent basis and those customers experienced difficulty dialing WorldPath lines. WorldPath understands that this phenomenon is typical of BA's inability to meet the traffic demands of the Farmington community on the Farmington Central Office for the last six months. In connection with these service failures, BA may have violated the Commission's rules concerning reporting facilities problems to the Commission.

To WorldPath's knowledge, BA continues to install new customer lines in the Farmington area, including second lines, even while it has disconnected WorldPath's established service. Further, BA has refused to honor a January 12, 1998 WorldPath order for an additional 24 lines to augment its current 96 lines.

BA's failure to address persistent problems at its Farmington Central office violates its obligations to WorldPath. BA has clearly been aware of inadequate capacity at the Farmington Central Office for the last six months. Despite this knowledge, BA took no action until January 27 when it disconnected WorldPath's lines with inadequate notice. Section 403.04 of the Commission's Rules compels BA to notify business customers *at a minimum* 12 days prior to any disconnection and, in certain circumstances listed in Section 403.06, on no fewer than five days notice. While there is an exception which allows BA to disconnect lines in an emergency, the exception clearly does not apply when BA has procrastinated in addressing well known deficiencies in its facilities. Had BA given WorldPath even 24 or 48 hours notice, WorldPath could have notified its customers of difficulties they would experience in accessing WorldPath's services and offered customers alternate dial-in numbers for Internet access. Section 1203.17 of the Commission's Rules requires BA to restore service "within the shortest time practicable consistent with safety" and "at a time causing minimum inconvenience to customers consistent with the circumstances." BA is not in compliance with this rule. WorldPath understands that BA intends to expand its Farmington Central Office capacity by February 14, 1998. This target date should be accelerated to comply with the requirement to restore service "within the shortest time practicable," particularly given BA's longstanding knowledge of problems at Farmington. Further, BA's inadequate notice of

**Chairman Douglas L. Patch
Commissioner Susan S. Geiger
Commissioner Bruce B. Ellsworth
January 30, 1998
Page 3**

disconnection did not allow WorldPath to minimize inconvenience to its business and the needs of its Internet access customers.

BA's disconnection of WorldPath is also anticompetitive. BA offers Internet access in New Hampshire through an affiliate, Bell Atlantic Internet Services, although not in Farmington. It is clearly inappropriate for BA to single out a potential Internet service competitor for disconnection. BA has undermined WorldPath's ability to serve its customers by harming its goodwill. Such action is anticompetitive given BA's involvement in the Internet access market.

WorldPath respectfully requests that the Commission investigate BA's recent disconnection of its lines and direct BA to reconnect the lines immediately. The Commission should also direct BA immediately to reconnect the disconnected lines in coordination with WorldPath and to honor WorldPath's order for additional lines before BA honors any new service orders. Finally, the Commission should investigate BA's failure to remedy longstanding service failures at its Farmington Central Office.

If the Commission has further questions regarding this matter, please contact us.

Very truly yours,



**Eric J. Branfman
Morton J. Posner**

Counsel for WorldPath Internet Services

cc: **Victor D. Del Vecchio, Esq.**
(by fax and Federal Express)
E. Barclay Jackson, Esq. (by fax)
Amanda Noonan (by fax)
Kate Bailey (by fax)
Michael W. Holmes, Esq. (by fax)

EXHIBIT B

STATE OF NEW HAMPSHIRE

CHAIRMAN
Douglas L. Patch
COMMISSIONERS
Bruce B. Ellsworth
Susan S. Geiger



PUBLIC UTILITIES COMMISSION
8 Old Suncook Road
Concord, N.H. 03301-7319

EXECUTIVE DIRECTOR
AND SECRETARY
Thomas B. Getz
TDD Access: Relay NH
1-800-735-2964
Tel. (603) 271-2431
FAX No. 271-3878

February 25, 1998

J. Michael Hickey
President & CEO
Bell Atlantic-New Hampshire
900 Elm Street, Suite 1927
Manchester, New Hampshire 03101-2008

Re: Action to Prevent Unacceptable Dial-Tone Response Levels

Dear Mr. Hickey:

The Commission is in receipt of the attached letter, dated January 30, 1998, from WorldPath Internet Services alleging that Bell Atlantic was aware of poor dial-tone response in Farmington, New Hampshire for several months. While we expect Bell Atlantic to respond directly to WorldPath regarding the Farmington situation, with a copy to the Commission, the Commission's first concern is for the public safety of all New Hampshire telephone customers.

We are all aware that the proliferation of Internet services and the much longer duration of "web-calls" compared to conventional calls has strained dial-tone response in many exchanges. We further appreciate the difficulty faced by Bell Atlantic in attempting to forecast the marketing efforts of Internet Service Providers and the resulting affect on dial-tone in each specific exchange. While these are significant challenges to the entire telecommunications industry, we expect that Bell Atlantic-New Hampshire is capable of monitoring dial-tone delays and responding to unsatisfactory levels such that situations like Farmington and the developing problem in Atkinson do not occur in the future. We further understand that Bell Atlantic has several solutions to the dial-tone delay problem but we do not have details or timing associated with the implementation of these solutions.

Given the recent issues with dial-tone delays and our joint concerns for public safety and quality of service to all New Hampshire customers, I would appreciate Bell Atlantic scheduling a meeting with the Commission Staff in March to address the following:

- peak period dial-tone delay data for the ten worst exchanges over the past year
- proposed action and action timing for each of the ten worst exchanges

J. Michael Hickey
February 25, 1998
Page -2-

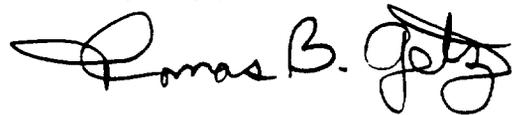
- proposals and timing for statewide improvement of dial-tone response
 - tariffing of ISP specific services
 - ISDN or other trunk-side solutions
 - DLC solutions
 - other

- proposal for a " ten worst" monthly report to the Commission Staff

I appreciate the efforts of Bell Atlantic to resolve our concerns for immediate access to 911 and overall dial-tone response. Please submit a proposed action plan at the March meeting with Staff and a recommendation for future monitoring that will insure and document the success of those actions.

Please call me or Forest Livingston should you have any questions or wish to discuss the matter further.

Very truly yours,



Thomas B. Getz
Executive Director and Secretary

Attachment

cc: Eric J. Braufman
Morton J. Posner
Kate Bailey
Debra Howland
Amanda Noonan
Forest Livingston

EXHIBIT C

Bell Atlantic
185 Franklin Street, Room 1403, Boston, MA 02110
Tel (617) 743-2323
Fax (617) 737-0648

Victor D. Del Vecchio
General Counsel - New Hampshire



April 3, 1998

Mr. Thomas P. Getz
Executive Director and Secretary
New Hampshire Public Utilities Commission
Eight Old Suncook Road
Concord, NH 03301-7319

Re: WorldPath Internet Services

Dear Mr. Getz:

This is in response to a letter dated January 30, 1998 from Eric Branfman and Morton Posner on behalf of WorldPath Internet Services (WorldPath) to the New Hampshire Public Utilities Commission. In its letter, WorldPath requests an investigation of New England Telephone and Telegraph Company d/b/a Bell Atlantic-New Hampshire's (BA-NH or the Company) action disconnecting 24 WorldPath lines in the Farmington, New Hampshire exchange on January 28, 1998. WorldPath alleges that BA-NH's actions violated its obligations to WorldPath, were not in compliance with Commission rules and were anticompetitive. For the reasons set forth below, BA-NH denies WorldPath's allegations, asserts that an investigation at this time is unnecessary, and submits that a review of the overall facts underscores the reasonableness of BA-NH's actions in this instance.

In June of 1997, routine monitoring of the Farmington central office (CO) indicated that certain engineering usage thresholds were being approached and that CO relief should be considered in the future. The Company determined that an additional switch line unit would be required to handle growth associated with the Farmington CO. An engineering estimate was prepared, and installation of the line unit was scheduled for completion by February 28, 1998.¹

During the week of January 26, 1998, the Public Utilities Commission Staff contacted the Company regarding certain complaints the Commission received regarding

¹ A line unit is equipment that concentrates subscriber traffic for processing by the switch. As a result, a percentage of access lines terminating at the unit have access to the switch at a particular moment in time.

dial tone delay (DTD) in Farmington. An examination of office data indicated that DTD was exceeding reasonable thresholds during various times of the day, especially during the peak busy hours between 4:30 p.m. and 9:30 p.m. In particular, the data for January 27, 1998 revealed significant DTD and raised public safety concerns.

On January 28, 1998, meetings were held among BA-NH engineering, operations and regulatory/external affairs managers to determine how best to address the emergency nature of traffic congestion in the Farmington CO. The Company determined that WorldPath was the largest multi-line customer in the exchange. Further, it appeared that WorldPath, an internet service provider that we understand is an affiliate of Union Telephone Company, was contributing heavily to the congestion in the Company's CO.

As a result of the meetings held that day, BA-NH decided to disconnect 24 of the 96 circuits assigned to WorldPath. The customer was notified immediately thereafter, and the circuits were disconnected approximately one hour later. The telephone numbers and multi-line hunt group numbers associated with the disconnected circuits were immediately faxed to WorldPath. While this action improved performance of the Farmington CO, it did not completely eliminate the DTD. Engineering and operations managers met to discuss the problem further and decided to advance the installation of the new line unit and to rebalance subscribers across existing line unit concentrators.² Recognizing that even this action would not fully restore normal DTD to Farmington, BA-NH quickly developed other options, including a plan to remove all of WorldPath's circuits from the Farmington office and to serve the customer from the Company's Rochester exchange.

On Friday night, January 30, 1998, BA-NH met with WorldPath to discuss options. At that time, once WorldPath rejected other service offerings, the Company began engineering activities to divert WorldPath's traffic to its Rochester exchange. After an extensive and expedited effort, on Wednesday, February 4, 1998, at 1 a.m., the Company transferred WorldPath's service to BA-NH's Rochester central office. BA-NH not only restored the 24 disconnected lines, but completed an outstanding WorldPath request for 24 additional lines, for a total of 120 circuits. It should be noted that, under this arrangement, WorldPath pays the tariffed business line rate for Farmington, even though the circuits are served from Rochester.

Data on the Farmington CO for the busy period on February 4, 1998 showed DTD was restored to normal levels - - absent WorldPath's traffic. The new line unit was subsequently installed and the office rebalancing completed on February 8, 1998. Since that time, no abnormal reports on Farmington usage have been generated.

Bell Atlantic regrets the fact that it was forced to take such action on relatively short notice. As even WorldPath acknowledges, however, the Company may take

² Rebalancing equalizes the usage among all available line units in a central office.

immediate action where circumstances warrant, such as the instant blockage caused by WorldPath's internet service activity, in the event of an emergency.³ At the time of its decision to disconnect, the Company reasonably concluded that such action was necessary to ensure continued access by the general body of ratepayers in Farmington to the public switched network. Once the action was taken, BA-NH took necessary measures to improve service to Farmington residents and extraordinary steps to restore and supplement WorldPath's service.

In its January 30, 1998 letter, WorldPath also attempts to equate the circuits that it ordered with ordinary subscriber access lines. The attempted comparison is inappropriate. BA-NH's public switched network is a shared resource, engineered on proven, long-standing principles used throughout the Bell Atlantic region and the entire country. WorldPath's use of its circuits, by contrast, is part of a usage-intensive nationwide phenomenon associated with internet access:

Growing use of the public switched telephone network (PSN) to access the Internet presents new, difficult policy concerns for regulators. Promotion of Internet use is consensus public policy nationally and even worldwide. But snowballing Internet growth has costs and allocative implications for Internet relayers (including providers of both the backbone network and access), for intermediate telecommunications carriers, and for end users, including both individuals and businesses....In summary, the telecommunications network is undergoing a transformation.

Pricing and Policies for Internet Traffic on the Public Switched Network, Report of the NARUC Internet Working Group, submitted to the Committee on Communications at the NARUC Winter Meetings, Washington, D.C., March, 1998, at 1 and 22.⁴

³ See, e.g., NHPUC-No. 77, Part A, § 1.4.1.D ("The Telephone Company reserves the right to restrict the amount of other services and equipment furnished or used in connection with any particular class of service in order to prevent any impairment in the quality of service furnished."); PART Puc 1203.17(d) - - "Interruption of Service" ("A utility may interrupt or curtail service and/or vary the characteristics thereof in the following circumstances: ... (2) When necessary to effect a temporary load reduction or temporary rationing of product for the common good of the utility system."); See also PART Puc 403.06 - - "Disconnection of Non-residential Customer." It should also be noted that WorldPath's reference to Puc 403.04 is unavailing, as that section does not apply to non-residential customers.

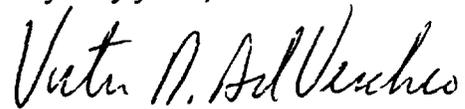
⁴ The NARUC Report addresses various issues associated with the explosion in internet usage, and includes an interesting and useful discussion of technical, pricing and subsidy concerns. As the Report explains, the "Internet is a packet-switched backbone network designed for data transfer, delivery, and retrieval" as distinguished from the "traditional, analog, circuit, local portion of the telephone network or PSN," which "relies on a continuous connection through the switching and transport networks to transfer voice or data." Id. at 3. "There is little doubt that the Internet has caused changes in the capacity used for some PSN calls and in the average duration and number of calls. The Internet has also affected the patterns of local use among and within LECs. LEC data show that the average duration of Internet calls

Letter to Mr. Getz
April 3, 1998
Page 4

In a Bell Atlantic filing in Maine, for example, the Company pointed out that internet traffic generates unusually long holding times over the shared public network: as much as 20 minutes per call or 39 minutes of usage per hour. The average voice call, on the other hand, lasts 5 minutes or less. WorldPath, an internet service provider, certainly knew and understood the probable impact its services would and in fact did have on the BA-NH public switched network.⁵

In short, the Company believes that it acted reasonably, at all times relevant to this matter, in meeting its obligations to both WorldPath and its other Farmington customers. As WorldPath's own manager acknowledged after submission of its January 30, 1998 letter: "When it came down to emergency situations it was addressed very quickly by the phone company." Haven Andersen, Clogged Phone Lines a Safety Concern, Foster's Daily Democrat, Feb. 16, 1998 at 1. A copy of the February 16, 1998 article is appended as Attachment 2. The facts bear out the prudence and fairness of BA-NH's actions undertaken to ensure the overall integrity of the network and to promptly restore and supplement WorldPath's service.

Very truly yours,



Victor D. Del Vecchio

cc: Morton Posner, Esquire
E. Barclay Jackson, Esquire
Kathryn Bailey
Michael Holmes, Esquire

getz.doc

is considerably longer than that of local voice calls." Id. at 3-4. A copy of the NARUC Internet Working Group Report is appended as Attachment 1.

⁵ This may be one of the reasons why WorldPath chose to locate in BA-NH's exchange, rather than that of its affiliate, Union Telephone Company. In doing so, WorldPath avoided congesting Union's central offices with WorldPath's heavy usage characteristics, terminating all of its internet traffic on BA-NH's Farmington switch on a non usage-sensitive basis. Under NHPUC-No. 77, Part A, § 4.2.1.A.1, "[n]o combinations of terminal equipment, multi-line terminating systems or premises wire can require or...[c]ause degradation of service to persons other than the users of the terminal equipment or multi-line terminating systems."

**PRICING AND POLICIES FOR INTERNET
TRAFFIC ON THE PUBLIC SWITCHED NETWORK
REPORT OF THE NARUC INTERNET WORKING GROUP**

Contributors

Jeff Richter (Wisconsin) - Co-Chair	Doris McCarter (Ohio) - Co-Chair
Mark Long (Florida)	Tom Solt (Missouri)
Vivian Witkind-Davis (NRRJ)	Joel Shifman (Maine)
John Hoag (NRRJ)	Barbara Combs (Oregon)
Terry Reid (Florida)	

Acknowledgments

Sandy Ibaugh (Indiana)	Michael Dorrian (Ohio)
Linda Schmidt (NRRJ)	

FINAL DRAFT

Submitted to the Committee on Communications at the
NARUC Winter Meetings, Washington, D.C., March 1998

I. Introduction

Growing use of the public switched telephone network (PSN)¹ to access the Internet presents new, difficult policy concerns for regulators. Promotion of Internet use is consensus public policy nationally and even worldwide. But snowballing Internet growth has costs and allocative implications for Internet relayers (including providers of both the backbone network and access), for intermediate telecommunications carriers, and for end users, including both individuals and businesses.

This report is the product of efforts by members of the National Association of Regulatory Commissioners (NARUC) Communications Committee and Communications Staff Subcommittee to address current public policy issues on use of the PSN to access Internet services to exchange messages and information, transfer data, and conduct transactions. Some of the issues were first formally raised before the Staff Subcommittee in a provocative panel discussion at the NARUC Winter Meetings in Washington, D.C., in February 1997. The Internet Working Group was formed at the winter meetings and sent a questionnaire to industry players in mid-April 1997. The Working Group reviewed responses to its questionnaire, comments filed at the FCC Notice of Proposed Rulemaking (NPRM) on Access Charges,² and comments filed in response to the FCC Notice of Inquiry (NOI) regarding use of the PSN by Internet service providers.³ A follow-up panel presented further discussion of the issues before the NARUC Communications Committee at its summer meetings in San Francisco in July 1997. The first draft of this paper was presented along with a request for comment at the NARUC Annual Meeting in Boston in November 1997.

AT&T reports that there will be 30 million Internet accounts for 43.2 million households and 2.1 million businesses by the year 2000. This growth will help people to do such things as pay bills, improve themselves through education, and work at home. Demands will also be made of the network to provide greater and greater bandwidth as multimedia, voice and other Internet applications become more commonplace. Intermediate telecommunications carriers (the ones that connect Internet end users to the Internet) are concerned that these increasing costs are not being borne by those causing the investments, thus straining the capabilities of some telecommunications resources previously deployed for other public and private purposes. The

¹ The FCC has begun to use the term public switched network, or PSN, in place of the public switched telephone network, or PSTN. The term PSN applies to "any common carrier network that provides circuit switching between public users." *Newton's Telecom Dictionary*, 9th edition (New York: Flatiron, 1995), 914.

² FCC 96-488, released December 4, 1996. Access Charge Reform, CC Docket 96-262.

³ FCC 96-488, released December 4, 1996. Usage of the Public Switched Network by Information Service and Internet Access Providers, CC Docket 96-263.

FCC's exemption of Internet service providers (ISPs) from access charges may be hindering migration of Internet use to more appropriate technology than the existing PSN, which is currently designed to handle voice traffic rather than data.

The Internet is first being deployed to large businesses and wealthier, more urban residential users. Schools, libraries and rural health care facilities nationwide are receiving subsidies for Internet investments under the Telecommunications Act of 1996, but there is no promise that other rural and low-income customers will receive Internet access any time soon. Planning for universal service has not addressed the means to support a ubiquitous national rollout of advanced telecommunications services maintained at affordable rates.

In this report, we analyze issues of PSN congestion, local access pricing, and universal service from the perspective of public service commissions concerned for the public interest, including the preferences of U.S. customers of telecommunications and Internet services and the broad range of providers of those services. Internet issues have also been addressed at the national level by the Federal Communications Commission (FCC), the Clinton administration, the National Telecommunications and Information Administration (NTIA) — the Administration's policy advisory arm — and the Rural Utility Service (RUS) in the Department of Agriculture.

We first address, in a qualitative way, the technical impact of the Internet on the PSN. We limit our analysis to consideration of calls dialed to *reach* the Internet. Some of this congestion is due to ISP failure to provide a sufficient number of connections for their users, so the users experience busy signals when they attempt to dial in.⁴ We do not address a second problem, the phenomenon known as the "worldwide wait," named because of slow responses to user requests while they are online to the Internet. Nor do we address congestion problems that may arise as a result of dial-ups to computers that do not involve connections with the Internet.

In Section II we review technical solutions for the problems posed to the PSN and some other vehicles for access to the Internet. The question is posed as to whether the PSN is the appropriate vehicle in the long term for carrying this traffic or whether some other network is better suited. We discuss the various technologies that may be used to provide access to the Internet, and their suitability and likelihood of becoming the preferred method of access in the short term and long term. We provide an initial, broad analysis of the costs of migrating the PSN to a data environment and relate this to currently available technology and emerging technologies.

Section III attempts to bridge the gap between the current regime of ISP exemption from access charges and appropriate pricing for the future. We examine the effects of the exemption,

⁴ Many software programs allow the user to instruct the computer to continue to dial until it successfully connects with the other computer. In the worst cases, repeated dialing may last an hour or more when the ISP has insufficient capacity for its customers. If many callers are engaged in repeated redialing, their combined calls could make a large contribution to busying out a switch.

exploring the positive and negative results of the exemption up to now and into the future for Internet use and the PSN. We discuss pricing options that may be suitable for high bandwidth data users as the PSN migrates toward a data environment.

Section IV is a discussion of some universal service issues raised by deployment of Internet services. The burden may fall on states to fund any early diffusion of advanced telecommunications services to high-cost and low-income areas. We examine possible state and federal policies for making Internet service available and affordable throughout the United States.

Having explored all of the issues and provided an analysis of the various dynamics and viewpoints we summarize the Working Group's conclusions and recommendations in Section V.

II. Technical Sources and Engineering Solutions to Possible Internet Congestion

The Internet is a packet-switched backbone network designed for data transfer, delivery, and retrieval. An important difference between packet-based and circuit-based networks (that is, the traditional, analog, circuit, local portion of the telephone network or PSN) is that the public switched circuit network relies on a continuous connection through the switching and transport networks to transfer voice or data, while the packet network is active only when delivering packets. In a circuit network, a channel is established for communications between the end users, and that channel is maintained until the connection is terminated. In addition, packets can be stored off-network for later access, delivery, or retrieval by an individual or group of users and need not be transported in sequence or over the same pathway. Thus a continuous packet connection to the Internet does not tie up the Internet work as an analog circuit connection would.

Because a continuous connection is maintained, using the analog voice network for data communications over the Internet is much less efficient than using a packet-switched network. In an Internet call, the Internet Service Provider (ISP) as well as the ISP's customer may be considered end users. ISPs are often connected both to a packet network over high speed dedicated facilities on one side for communication with the Internet and to the PSN through local business lines on the other side to provide access for end user customers. When an ISP bridges the circuit-switched PSN and its packet-switched network, the mismatch of technology is only partially mitigated by modems. Modems (modulator/demodulators) convert digital data for transmission over the local (or toll) analog network to the interconnection point of an ISP where it is packeted for delivery over the Internet network.

There is little doubt that the Internet has caused changes in the capacity used for some PSN calls

and in the average duration and number of calls. The Internet has also affected the patterns of local use among and within LECs. LEC data show that the average duration of Internet calls is considerably longer than that of local voice calls. The LECs claim that the growth in number and duration of Internet calls has caused facility congestion problems in interoffice trunking common in multi-office exchanges and extended area service (EAS) arrangements. ISPs, on the other hand, allege that empirical data do not prove the existence of congestion on the Internet. They and other observers believe the PSN, if properly managed, will be able to accommodate the growth with little problem. While many organizations debate the locus, frequency, and severity of Internet access congestion using the PSN, the technical community is preparing short-, medium- and long-term solutions. This section examines some possible directions that PSN access to the Internet network may take.

The long-term scenario foreseen by all respondents to the Working Group survey is the relocation of interoffice data services from the PSN to a digital packet network. Access to the packet "cloud" could be achieved through many means, including improved resource management, residential Integrated Services Digital Networks (ISDNs), digital subscriber loops (DSLs), or displacement of dial-up over analog modems with cable modems or wireless.

Respondents to the NARUC survey and to the FCC's NOI regarding Usage of the Public Switched Network by Information Service and Internet Access Providers (Docket 96-263) provided valuable insight into specific mechanisms of the congestion problem but not its scope. The primary problem is excessive blocking of calls at originating end offices due to resources in use by calls to Internet service providers (ISPs). Sub-problems include:

1. Quantities and configuration of (inbound) line control modules (LCMs)
2. Insufficient interoffice trunking
3. Lack of sufficient terminating CPE (for example, ISP modems) as blocked users. persistently re-dial

ISPs must work to avoid the third type of problem above, where their modem banks are oversubscribed and caller retries "busy out" the switch. The same "first order" statistics developed by telcos can assist ISPs in designing the capacity of their trunks and modem banks.

Two fundamental premises must be presented as background. The first is that all communications networks are designed to meet probabilistic demand calculated at the busiest hour of the day, week, month, and year — and are not designed to provide service to all customers simultaneously. The second is that this busy hour exists during the work day and consists mostly of voice calls. While it is true that, on average, call durations ("holding times") by modem to ISPs are longer than voice calls (Bellcore: 20 minutes compared to three minutes, respectively), it is the total traffic offered in centum-call-seconds (CCS) that is the center of the congestion problem. While many respondents could identify PSN usage attributable to Internet

calls. no telephone company contended that the Internet has *in general* caused shifts in the busy hours. At face value, this would indicate (falsely) that the existing voice network is sufficient for Internet callers and that no additional capital equipment is required. Rather, situations arise where additional equipment has been required to maintain quality of service. In their survey responses, PacBell and Bell Atlantic cited examples of congestion in their Santa Clara and Herndon end offices, respectively.

Short Term: Improved Resource Management

The primary reaction to congestion on the access side of the switch is to reconfigure line units. Bellcore viewed the problem of congestion as separate issues of trunking and access and provided different solutions for each.⁵ In the short term, Bellcore noted that the present mode of operations can be managed better, reducing switch stress by de-loading switches and routing Internet calls more intelligently.

A moderately complex task is to rebalance subscribers across existing line concentrators (there is a range of lines which can share a single line unit based on the number of minutes at any given time the lines are experiencing). A more interventionist (and costly) step, if rebalancing is unsuccessful, is to regroom the switch by adding line units and reassigning customers.

Interoffice trunking congestion may still occur even in the absence of access line overload. One telco that has extensive ISP subscribership on primary rate interface (PRI) digital trunks has still had to utilize foreign exchange (FX) trunking to process these calls over the interoffice network. While FX-type trunking can be used to alleviate congestion on the voice trunk groups, it can still result in a less efficient use of the trunks themselves.

One solution recommended by Bellcore is the installation of equipment "upstream" of the switch that would divert, based on dial number, ISP calls from switch line concentrators used by voice customers. This "pre-switch adjunct" equipment is already being sold by Lucent and Nortel, manufacturers of the dominant Class 5 switch models. Each of these product solutions has characteristics or limitations that make them less than attractive in all situations.

The Internet Access Coalition, which contends that the Internet access congestion issues arise from poor resource management within switches, notes that digital trunking by ISPs is technically feasible but is not economical. Dial-up calls to ISPs that have T-1 or Primary Rate ISDN would bypass the switch components that are subject to access congestion. Their analysis, however, showed that, in many regions, an ISP would find it cheaper to operate analog lines (prone to congestion) than equivalent ISDN-PRI or T-1 service that is non-blocking.

⁵ Amir Atari and James Gordon, *Impact of Internet Traffic on LEC Networks and Switching Systems* (Red Bank, NJ: Bellcore), 1996.

Medium Term: Technological Solutions

Some emerging products and services have the potential to operate without congestion to the PSN. We will briefly introduce options for digital subscriber loops (DSLs), ISDN, and Internet routers. While each of these is technically attractive, each also has economic or locational impediments to deployment.

1. Digital Subscriber Loop

Digital Subscriber Loop (xDSL) technology is a potential long-term access technology that would use existing copper pairs to connect customers directly to the packet "cloud." The particular variant of xDSL to consider, according to vendor ADC, is based on speed, operating distance, upstream and downstream speed differential, and suitable applications. xDSL will someday be a high-performance (T-1 or higher) access solution for the 80 percent of customers within 18,000 feet of an end office, but currently it is not generally available. Similarly, cable modems offer local area network (LAN) style Internet connections to customers, but existing cable infrastructure is suitable only for 15 percent to 20 percent of potential users. Other potential Internet access media include powerline carrier (Norweb) and satellite downlink.

2. ISDN

Both Primary Rate and Basic Rate ISDN (PRI and BRI) are viable technical solutions for alleviating access congestion. ISDN pricing, however, has been inconsistent, and some respondents, including AT&T, believe that the associated network and customer premises costs and technical limitations mean that widespread deployment is years away, while others, such as Bell Atlantic and U S West) noted that ISDN is an affordable option that will meet the needs of the market for years to come.

Digital trunks such as Primary Rate ISDN and T-1 can link ISP points of presence (POPs) with ISP modems and alleviate load on switches, but current tariffs are higher than for equivalent POTS lines. Bellcore notes that the packet ("D") channel of Basic Rate or Residential ISDN could be used by customers to connect to existing telco packet networks. Residential ISDN connections bypass switch components prone to congestion.

3. Router Development

Internet routers could potentially be the bridge between the current voice telephony and the data network of tomorrow. In the short run, traffic could be routed over a dual network. There is even debate that the dual network may continue in the long run due to the sheer expense of converting the PSN to a data friendly network. Under the dual network concept, voice would be processed according to one set of parameters and traffic destined for an ISP could be routed onto data facilities. In the long run, the Working Group envisions that all data (including voice) could be processed in a uniform manner. Right now, it appears that packets may be the most likely

method for backbone networks, with a variety of digital solutions for local access. Some parties advocate that a more efficient configuration would be for routers to be placed at all switches, therefore, the originating switch could determine if a call is addressed to or from an ISP and thus route its traffic onto a data network.

The location of routers is a function of cost. The basic assumption with using a router system is that there would be new costs associated with processing traffic over these facilities. If transport is charged for traffic from the router, then ISPs have a much greater incentive to build their own facilities to the office with a router than to pay the ILEC to transport the traffic. Of course, the placement of its own facilities to a router would require a higher profit threshold for the ISP, so whether it would go into a rural area using its own facilities is unknown. In other words, rural areas may still have difficulty obtaining Internet service either due to having to make a toll call (or pay a higher transport cost) because the ISP server is in a distant area or because providing transport to a closer office with a router involves more facilities placement cost on the part of the ISP. Requiring ILECs to provide the transport from the routers to the ISP does not solve the bandwidth problem unless hi-cap facilities are placed and then priced close to cost. Then the matter simply becomes one for the ISP of revenues versus cost.

Routers could be placed in tandem, however, this does not stop Internet traffic from entering the PSN. Tandem router placement may be an acceptable solution but once bandwidth requirements increase, congestion could become a problem for both the ILEC and the end users' requirements. Tandem placement of a router could be very useful if there is terminating end office switch congestion. Tandems are typically designed to carry significant traffic flows. However, there has been no contradictory evidence to the ISP contention that the switch congestion problem most often spoken of is with the terminating switch. It is before this switch that traffic must be diverted. Therefore, locating the router at the tandem and then providing hi-cap transport between the router and the ISP server could solve many problems for the terminating switch.

Long Term: Network Evolution of the Internet and Internet Access

The Internet, beginning at backbone level, has begun the transition to packet technology. The backbone technology chosen by MCI, UUNET, and others is Asynchronous Transfer Mode (ATM). ATM is similar to frame relay (FR) and X.25 networks in that it is a shared resource, gaining efficiency by multiplexing many streams together to provide virtual private services.

Bell Atlantic and U S West, in their survey responses, anticipated the full spectrum of ATM and frame relay networks, using xDSL and cable modems as well as improved analog dial for access.

BellSouth, in comments in CC Docket No. 96-263, outlined a proposed network which the company said would be suitable in the long term. BellSouth stated that the Commission's current rules regarding protocol conversion would make it impossible for it to implement such a network, however. Dial-up connections would be routed to the network access server that would, in turn, be connected to a "radius" or routing server. In other words, based on the number dialed

by the Internet subscriber, the radius server would identify the Internet provider to which the network access server should establish a data connection. The network access server would then make the connection to the underlying ATM/Frame Relay network to which the Internet provider would also be connected.

The possible paths discussed here for long-term Internet evolution are based upon developing technology and media. Given the rapid progress in the fields of communications and electronics, in just a few years the Internet may well use as yet unheard-of technology to speed the transport of data to and from the end user. The trend seems clear: as we move ahead in time, the capability of higher speeds of data transport will move closer and closer to the end user.

Costs of Reducing Congestion

Many levels of solutions can be applied to the general problem of PSN congestion, the ultimate being relocation of data services to broadband packet networks. While the costs of this solution have not been estimated, the costs of some solutions are more easily calculated. We have figures for the cost of labor to reconfigure switches but lack cost data on line cards themselves and the new category of pre-switch adjuncts, as deployed. Cost data are available for some ways for ISPs to mitigate congestion, including digital T-1 or ISDN PRI. Regulators must use the information they have and obtain the further information they need to develop pricing strategies to encourage the use of data-friendly infrastructure. Because competition is in a nascent stage and the Internet is growing so rapidly, it may not be sufficient to wait for new providers to place their facilities.

III. Appropriate Structure and Charges for Local Network Access

Access Charges

Although several avenues are open for evolution to networks that support data better than the existing PSN, the current exemption of ISPs from access charges inhibits that transition. The number of people subscribing to the Internet keeps growing, but unless the Internet acquires more bandwidth it may encounter an application constraint both on its own backbone and on the PSN. The comparative price of compatible CPE and local lines with packet switching capability versus current analog modems and circuit switching is a disincentive for Internet users to migrate to "data-friendly" technology. The exemption of ISPs from access charges distorts prices and sends incorrect economic signals to end users and Internet service providers. Until end user demands for bandwidth force ISPs to use what are probably more expensive data networks, ISPs will continue to purchase analog lines and use modems to change digital messages to analog and back to digital packets for delivery over the packet network. So, to some unknown extent, the exemption is helping to keep the Internet from growing into a mature multimedia network.

The ISP exemption grew out of the FCC's Computer II proceedings in the 1970s, in which the

Commission introduced a distinction between basic and enhanced communication services. Enhanced services include access to the Internet and other interactive computer networks. In a 1983 access charge order the FCC decided that even though enhanced service providers (ESPs) may use the facilities of local exchange carriers to originate and terminate interstate calls, they should not be required to pay interstate access charges.⁶ In its 1997 access charge decision, the FCC decided to maintain the exemption. The Commission noted that the term "information services" in the 1996 Telecommunications Act appears to be similar in meaning to "enhanced services."⁷ The Act establishes a policy "to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by federal or state regulation."⁸

The FCC decision means ESPs (including ISPs) may purchase services from incumbent local exchange carriers under the same intrastate tariffs available to end users. They pay business line rates and the appropriate subscriber line charge rather than interstate access rates. Business line rates are significantly lower than equivalent interstate access charges because of separations allocations, pervasive flat and message rates for local business service, and the per-minute rate structure of access charges.⁹ On the other hand, interexchange carriers (IXCs) at least for now must pay access charges for similar connections to the PSN.

Most ISPs purchase analog business lines from the LEC at a fixed cost per month. Most households and businesses can purchase access to the Internet through a flat monthly charge from an ISP. The local usage on the lines over which they place calls to access the Internet is generally priced on a flat monthly or message (per-call) basis. These rates are based on local usage rates. The lack of true time-related charges on either end of these calls encourages long call durations. The ILECs claim that the long holding times associated with Internet calls burden the PSN and have caused, and may continue to cause, network congestion and blocked calls. If the ESP exemption were discontinued, the LECs argue, a more accurate pricing signal would be sent which would encourage ISPs to seek more efficient methods of serving their end users.

The access charge exemption is a preference for a certain class of users of the public switched network, just like the home mortgage payment exemption is a tax preference in the federal income tax system. A preference acts like a subsidy to a certain group or function, foregoing funds that would otherwise go to common use. It is as an active policy preference that the exemption has been supported — something that will encourage development of the Internet and the many benefits we can see from having this new means of information exchange, plus

⁶ FCC 1997 Access Charge NPRM, para. 284.

⁷ *Ibid.*, para. 284.

⁸ 47 USC, para. 230(b)(2).

⁹ FCC 1997 Access Charge NPRM, para. 285.

innovations yet to come. There is a strong public interest argument for government promotion of the Internet. The Internet User Coalition, for example, commented to the Working Group that the Internet provides citizens a venue for political speech and access to information, lifelong learning, communications and commerce.

ISPs argue that exemptions were justified in the first place and continue to be needed now to support a nascent industry. Many commenters in FCC dockets and the Working Group's survey argued that applying any extra charges to the ISPs would stymie the Internet's growth. ISPs argue that the access charge exemption is an incentive for investment and innovation in information services and thus serves U.S. industrial policy. The ISPs and their supporters say that even though the Internet business has grown, it is still volatile and prospects for success are uncertain.

Another argument for keeping the exemption is that the existing access charge system is inappropriate. BellSouth maintains that it is better to keep the current access charge exemption than to apply an access charge regime that was designed for circuit-switched voice telephony. Most telecommunications industry analysts agree that access charges are too high. The FCC said it saw no reason to extend the existing imperfect access charge regime to an additional class of users, when it could have detrimental effects on the growth of the information service industry and the existing structure.¹⁰

Those who continue to be opposed to the access charge exemption for ISPs now and in the immediate future claim that Internet use is already causing congestion, particularly in the switch from which the ISP is served. The Alliance for Public Technology, in comments on the FCC access charge NPRM, said ISPs are thus paying less for using the local network than other businesses, even though some claim they impose greater demand for ports, switches, lines and other network elements. Bell Atlantic suggested the exemption creates a financial disincentive to switch to data networks where they are available, encouraging ISPs to purchase circuit-switched services instead of packet-based. The general exemption of ISPs may also ignore differences in traffic patterns among ISPs and even in Internet uses, another commenter suggested. Some of these providers may pose a larger immediate burden on the network than others.

Rural Utilities Services (RUS) told the NARUC Internet Working Group that the ISP exemption means rural telephone companies are losing toll support they would otherwise receive because many calls made to access the Internet are toll calls. Because the rural carriers do not have access to the toll revenues by virtue of the exemption, local rates are forced up as plant must be put into place to handle the increased "local" traffic, and revenues must be generated to recover the cost of this plant. (This issue is discussed further below, in section IV, on universal service.)

Whether or not ISPs are causing congestion now on the public switched network, the access

¹⁰ FCC 96-488, para. 288.

charge exemption encourages growth of Internet use that can lead to overloading a network designed for voice communications. Asked whether the exemption influences network deployment decisions all respondents to the working group survey who answered the question said it does. AT&T said the exemption discourages CLECs and ILECs from developing new service offerings that have to compete with below-cost access services used by ISPs. The company said neither CLECs nor ILECs are receiving accurate economic signals that would encourage them to upgrade networks or engineer existing ones more efficiently because they are being denied the revenue streams to pay for the upgrades or transition activities. BellSouth and U S West made similar arguments.

The access charge exemption has an influence on who will win and who will lose in the marketplace for telecommunications services. Interestingly, many ISPs no longer argue for the exemption on nascent industry grounds, but on competitive grounds. They suggest that independent ISPs are now battling ISPs affiliated with other carriers so the independents need a price break to level the playing field. Some ISPs also suggest that since they have no adequate widespread technological alternative to ILEC networks, to continue the exemption will force ILECs to upgrade. Until that happens, they claim the exemption is a monetary recognition of the PSN's shortcomings for data transmission. ISPs and others also allege that the revenue from the second line which computer users tend to order has not been considered as an offset to any additional PSN costs. They further point out that many ISPs are phone companies themselves and argue that those ISPs would not be providing Internet service if it imposed unrecoverable costs.

Other telecommunications companies see the exemption as giving unfair competitive advantage to ISPs. AT&T commented that the IXCs are paying "artificially high non-economic subsidy laden charges" and ISPs are paying below costs. AT&T maintained that IXCs are at a competitive disadvantage since ISP services (voice over net, faxes) are cross elastic. Bell Atlantic and U S West advanced similar arguments from the perspective of the ILECs. Bell Atlantic suggested that if IXCs moved voice traffic onto the Internet, and the exemption continued, ILEC costs would increase without an adequate cost recovery mechanism. Resellers agreed that preferential treatment of ESPs over other telecommunications service providers gives "unwarranted competitive advantage." The Telecommunications Resellers Association said ISPs should be brought under the access charge regime.

Jurisdictional Issues

Any discussion of the appropriate pricing for network access to the Internet must include jurisdiction. While it is the Internet Working Group's strong hope that any pricing options advanced herein would be applied on both the interstate and intrastate level, should that not be the case, the Internet Working Group would offer its analysis and conclusions for consideration by the states.

The FCC's finding that ISP traffic is exempt from interstate access charges is not readily interpreted as a decision regarding the jurisdictional nature of the traffic. It does not make it any less an interexchange, and ultimately an interstate and international, connection. BellSouth commented that the exemption should not and does not change the underlying jurisdiction of the traffic. The FCC decision leaves state regulators with jurisdiction for local rate and policy applications. It is reasonable for them to interpret this traffic as local by default. Yet the reason the FCC can apply its exemption to interstate access in the first place is that at least some of the traffic traverses state and national boundaries. In general, only the local phone dial-up number makes it appear local. This was true with call traffic into many early toll resale enterprises. If the incoming ISP traffic is on a toll call or 800 number, intra- or interstate access charges are being applied today.

If ISP traffic is interstate, as the FCC's assertion of jurisdiction to apply the ESP exemption indicates, then this issue is ripe for reevaluation under jurisdictional separations. Comprehensive jurisdictional separations reform is currently under investigation and assigned for resolution to the Federal-State Joint Board on Separations.¹¹ The NPRM does not refer specifically to ISP traffic, but to data traffic generically, in its request for comments on these issues.

If the traffic is interstate, a workable solution was suggested by several parties to apply to ISP traffic only the traffic-sensitive portion of access charges without any common line component. This is the intended ultimate goal of the access reform ordered by the FCC for Tier A LECs' interstate access charges¹², and a solution recommended by several parties in the FCC's NOI on the Internet.¹³

If ISP traffic can, due to the exemption, be interpreted as jurisdictionally local, states do have options for solving the problems associated with this rapidly growing segment of local traffic. The solutions then would have to be with regard to local service pricing. If the jurisdiction of the traffic is split, identification of the local traffic that is Internet directed would be necessary. This could necessitate the imposition of considerable registration and reporting requirements.

Changes in pattern of use, call duration and number of calls may make the existing separations (Part 36 methodologies) process inappropriate due to resulting large separations shifts for some companies. Under Part 36 many portions of the network are allocated based on jurisdictional minutes-of-use (MOUs) or weighted jurisdictional MOUs. An increase in usage caused by the Internet calls could vastly increase the allocation of cost to the intrastate jurisdiction due to the ESP exemption. This is because the exemption causes LECs to treat the costs of serving ESPs

¹¹ CC Docket No. 86-280, Jurisdictional Separations Reform and Referral to the Federal-State Joint Board, released October 7, 1997.

¹² Access Charge Reform, First Report and Order, FCC 97-158.

¹³ Usage of the Public Switched Network by Information Providers, FCC 96-488.

(which include ISPs) as a cost of serving local end users.

In general, LECs claim the Internet causes their revenue requirement to increase because they may need to install more inter-office and switching facilities to handle the vast increase in traffic caused by the Internet, while a lower percentage of the total cost is allocated to the interstate jurisdiction due to the ESP exemption. Compounding this problem is that the Internet may cause the need for network upgrades all the way to the end users as essential service requirements under universal service programs expand to meet basic end user demands. This separations problem causes the company's intrastate jurisdictional allocations to increase, which may result in requests by some companies for intrastate rate increases claimed to cover costs primarily incurred for a jurisdictionally mixed or interstate service.

At this time the Working Group agrees that Internet traffic is indiscernible. However, the Working Group believes that this is because no one is attempting to record the traffic. Much as 800 traffic was originally viewed as indiscernible and later able to be tracked, so too could be the case with Internet traffic.

Options for Pricing Internet Access

Most interested parties agree that government should not establish a social goal with respect to which technology or network is used to deliver Internet services. However, many parties fail to acknowledge that government already has influenced the growth of the Internet by extending the ESP exemption to ISPs. While in the past Internet traffic was not of such a magnitude or sophistication to affect the PSN, its continuing growth leads one to question whether the time has come to reconsider how Internet traffic is priced. Should government continue the preferential rates for ISPs, apply traditional access charges to them, or design a new pricing mechanism? As we discuss the various dynamics associated with pricing PSN access to the Internet, we must keep sight of the overall fundamental network change — whether the result is a data-friendly PSN or a dual PSN composed of one network (route) for voice and one for data.

In regard to the standard argument of whether ISPs should pay traditional access charges, some parties concede that if the Universal Service Fund is designed to recover all needed local revenues, typical interstate access rates could decline sharply and then ISPs could pay the new access rates. By doing this, the rates would be close to cost and that would send the correct market signals to ISPs as to whether or not they should obtain another method of access which would give them the data capabilities that their users need or desire.

However, current access charges are based on voice technology. Given the growing data usage of the network, the Working Group is concerned that the traditional rate structure for access charges may not reflect future network usage. Therefore, we have explored rate structures which may be more suited to data traffic. We recognize that this leap in rate structures from the current regime may produce a "gap" between rate structure and actual network deployment of technology, but we believe, at this juncture, that regulators must begin to prepare for the

fundamental change the network will undergo. Most commenters did not offer any pricing options for Internet usage. Basically there were two viewpoints: continuation of the ISP exemption and an access rate that is lower than current access rates.

All the commenters to the working group survey agreed that end users should not be required to pay for the ISPs' use of the PSN. If any increased charges are to be paid, the commenters suggested, they should be paid by the ISP directly. However, all parties also recognized that any increased costs to the ISPs will be passed along to end users.

Alternatives to a voice-based pricing scheme were not advanced, although several ISP commenters expressed concern about usage-sensitive pricing. Some sort of flat rate, cost based, block rate pricing might alleviate some ISPs' concerns over their cost volatility. Moreover, many ISPs want the ability to purchase UNEs, without being designated a carrier.

One suggestion offered by the Working Group was that wireless interconnection rates be used as a surrogate for ISPs' access to the PSN. Only one party commented on this suggestion. It argued that wireless interconnection rates should not be assessed on ISP providers because while an Internet call is roughly 20 minutes in duration, a wireless call is 2 ½ minutes for cellular and 5 seconds for paging. Therefore, wireless service is not analogous to Internet service and the rate should not be transferred. In short, whereas a wireless customer may view a \$0.20 call to be affordable (based on a rate of \$0.08 a minute for a 2.5-minute call) an ISP user would not view a \$1.60 call to be reasonable (based on \$0.08 a minute for 20 minutes).

The Working Group also explored the possible development of a special category of end user (if the exemption continues) whereby outgoing call volumes above a certain level would require the end user to be migrated onto a service which is priced and engineered to recover and account for the high call volume. However, the Working Group is mindful that the application of some sort of per minute local measured service (LMS), in many states and localities, is either statutorily forbidden or politically obstructed. Also, if a pricing scheme were applied to Internet traffic only, it could be challenged as discriminatory and subject to litigation. Another solution could be to charge all customers in markets without LMS for all incoming local calls above a certain level. This could eliminate the need to separately identify the traffic as Internet directed. If a high enough set amount of incoming traffic were free each month, ISPs would likely be the primary recipients of this charge.

Another idea put forth by the Working Group was the use of the Signaling System 7 (SS7) network and rates to process Internet calls. All carrier commenters rejected the idea of using the SS7 network. They argue that the SS7 network is designed and maintained as a signaling network and could not handle Internet traffic, even though it is similar to packet technology. Also, many commenters are concerned that the implementation of local number portability (LNP) will consume the spare capacity of the SS7 network. Consequently, there is little spare bandwidth on the SS7 network for other traffic. No commenter addressed the question of

whether the SS7 network could be expanded to fulfill this function.¹⁴

Most commenters to the survey argue that there should be only one access charge structure since the network is performing the same function regardless of whether voice (analog) or data (packet) is being transmitted. However, if access charges are not brought down to cost and government feels the need to keep the cost of access to the Internet low, care should be taken to at least price the services and/or facilities close to cost. This pricing policy would have the effect of incenting the providers of the PSN to deploy a more data-friendly network and of encouraging the use of more data-friendly facilities on the part of end users and ISPs.

Reciprocal Compensation

In addition to general concerns about the appropriate pricing for access to the Internet, regulators have recently been faced with the question of what compensation should be paid between carriers for the exchange of this traffic. It should first be noted that although the battle over pricing access to the Internet has spilled over into reciprocal compensation, the general pricing and costing dynamics mentioned earlier in this paper have not changed. What we now address is the question of cost recovery/revenue generation when some ILECs bypass the end user and ISPs and instead focus on intermediate carriers as their revenue source. This section will discuss the various options for resolving the reciprocal compensation question should a state commission assert its jurisdiction in resolving a dispute on this issue, as a number of commissions already have.

The basic allegation in the reciprocal compensation disputes is that all calls to ISPs are long distance. To support this conclusion some carriers are claiming that in order for the FCC to have exempted ISPs from access charges, it must have assumed that the nature of ISP traffic, both to and from the ISP, is long distance, perhaps even interstate. The Internet Working Group asked participants in the group's survey whether the ESP exemption creates an incentive for CLECs to want ISP servers at their end offices in order to recover the terminating unbundled local switched rates. AT&T replied that the exemption perpetuates uneconomic behavior in many forms, but that Internet traffic is interstate, not local, so the reciprocal compensation portions of interconnection agreements are inapplicable.¹⁵ We have already discussed the pragmatic matters associated with identifying traffic destined to ISPs or large terminating users. We will assume that these end users are somehow identifiable. With that caveat, there are four basic avenues to resolve the compensation issue.

The first avenue would be to agree with the carriers who assert that some or all calls to the ISPs

¹⁴ Bellcore did advance this viewpoint in its paper, "Architectural Solutions to Internet Congestion Based on SS7 and Intelligent Network Capabilities," Atari and Gordon: Bellcore, 1997.

¹⁵ See U S West, 7.

are long distance calls. By reaching this conclusion the commission could simply acknowledge that there is a massive amount of traffic which does not originate and terminate within an ILEC's local calling area. Given that neither the Telecommunications Act nor the FCC has eliminated the distinction between local and non-local, this could be a solution. However, one would first need to examine whether all of the calls, or at least a majority of them, can be traced to their termination points. After this measurement is done, one could employ the use of PIUs (percentage of interexchange use) to assess charges. The difficulty associated with this solution is that regulators would have to undertake a task that they have not typically done. They would have to look behind an end user's private network to determine where traffic is ultimately terminating. Furthermore, regulators may find that such a determination is used to support an ILEC's claim that all end users should be paying access charges since the existence of the intermediate carrier does not change the nature of the end user's call to the ISP. If a state believes that the service provided by ISPs is a carrier-type (and non-local) service, and the FCC agrees, then a state commission may find this solution a desirable means to correct a perceived incongruity in the treatment of ISPs vis-à-vis IXCs.

Another option is not to look behind an end user's private network, regardless of whether it is open or closed to the general public, and continue to treat such traffic as local, including the non-application of access charges. While the Telecommunications Act did continue the distinction between local and non-local service, one can assert that this distinction lies primarily in the nature of traffic which carriers are processing. Therefore, if traffic processed within only one network would be considered local, then the same traffic processed within two networks covering the same local calling area should still be considered local. Furthermore, if a state determines that the flat rate usage packages which are currently being subscribed to by its end users are cost compensatory of all the minutes the end users are generating, this option is further supported. It may be inappropriate from a public interest viewpoint to assess access charges to a private network for traffic which terminates to it, especially when it has been determined that end users are fully compensating the LEC for traffic which they are generating. If a state were to allow access charges to be assessed in this situation, it may wish to develop an understanding with the ILEC concerning the adequacy of the ILEC's network in processing data transmissions and further steps which may need to be taken to develop that network. Lastly, this option would continue to provide CLECs with a revenue stream to finance the building of their networks.

A third avenue to resolve this dispute is that there be no compensation exchanged between carriers for traffic to an ISP. The argument for this option is that so long as no carrier is receiving compensation for calls to ISPs, each will have the same perspective on ISPs. For example, right now many ILECs have a very large majority of their residential customers subscribed to low flat rate usage service. As such, it is very difficult to obtain additional revenues from their customers for the large amounts of traffic they generate once they start subscribing to the Internet. So, as alluded to earlier in this paper, the ILECs arguably are not being compensated for the usage of their networks. With the existence of an intermediate carrier, not only are the ILECs perhaps not compensated, but they must pay carriers for termination on the other carriers' networks. By not allowing compensation to flow between the carriers, neither

carrier would be compensated for this traffic. This is how both carriers would come to view ISPs in a similar manner. The revenue which they could generate from the ISPs would be the charges they directly assess to the ISP. The only complexity in this argument would be those ILECs and their associated end users who subscribe to local minutes-of-use service. In this scenario the ILEC is being compensated by the end user for the use of its network, so the dynamic of the non-recovery of costs through flat rate end user charges does not exist. The difficulty of distinguishing between Internet minutes that are subject to flat rates and those subject to minutes-of-use charges may render this solution unworkable. Another potential adverse effect of this scenario may be that, once CLECs are no longer compensated for ISP traffic, their traffic imbalances become so great that they are unable to sustain themselves financially. This dynamic would be very difficult to assess currently because if a CLEC is marketing mostly to ISPs, they will intentionally have few other customers. Therefore, assessing whether they can be financially sustainable in the long run may not be readily achievable today.

The fourth avenue open to regulators is more complex. This solution requires that ISPs be assessed a "termination surcharge" when calls to it attain a certain level. In this manner, non-ISP end users do not have to have any of their rates adjusted. It would be the ISP who would pay for the traffic terminating to it. The complexity in this solution is when the end user resides on a carrier's network different from the carrier network on which the ISP is located. This is because, technically speaking, the carrier which is owed money from the ISP is the end user's carrier. In this situation it may be that the ISP's carrier becomes the collection agent for the originating carrier. In this scenario, the terminating carrier could still be paid the terminating charges owed to it. The result could be a sort of netting.

IV. Relationship of Internet Access and Universal Service

Universal service is a complex issue with a seeming myriad of ongoing controversies. The issue involves setting and achieving objectives for telecommunications infrastructure and subscription levels. In terms directly relevant to the Internet, the issue is the degree to which advanced telecommunications infrastructure should be ubiquitously available and which services should be included as universal service offerings?

Many businesses and institutions have turned to virtual private networks to meet their computer and telecommunications needs. This trend is fostered by the technological availability of virtual channels within the PSN providing bandwidth or capacity reservation at flat rates. Higher-speed PSN offerings are based on an access line charge with usage priced on a per-unit basis. Further, video transmissions are handled by the PSN as data. Because of these dynamics, questions arise regarding the appropriateness of differentiating data and video transmissions on the PSN and what type of rates to charge for potentially bursty and voluminous transmissions, particularly in relation to the pricing of voice traffic. Currently, because one can obtain bandwidth at a flat rate and because video-dedicated channels appear more reliable, they are more attractive than typical switched or derived video channels on the PSN. As a result carriers have an incentive to invest in adjunct networks that carry high speed, high volume data and video transmissions but do not

have the incentive to invest in advanced infrastructure placed in the PSN itself. This has the undesirable effect of denying or delaying the general offering on the PSN, to residential and small business customers, of a reasonably priced high speed form of access to the Internet.

Universal service planning should address the means to support the concomitantly necessary investments for designated advanced telecommunications services for which customer demand will not garner sufficient revenue to support facility placement. Such concerns would encompass the need to subsidize, in some areas, infrastructure necessary to provide advanced services or to facilitate Internet access. Even the current USF rules may inadvertently be slowing the roll out of advanced telecommunications to the general public. This is because, in some cases, the diversion of educational, health care and library institutions' usage, and attendant revenues, from the PSN to private two-way video and data networks has and will continue to exacerbate the need for support funding to keep the rates for advanced telecommunications services low enough to be considered affordable. This problem is particularly acute in rural and low income areas.

In addition, there are overlapping and conflicting aspects to the drive for a ubiquitous national roll out of advanced telecommunications services and the need to define, and maintain at affordable rates, "basic" or "essential" telecommunications services. In this debate, regulators must be careful not to over-plan the deployment of advanced services. Where regulators believe companies are making significant infrastructure inroads, or are trending to this, caution should be employed so that one does not fund infrastructure investments that would have occurred anyway. Many rural and low-income markets often experience a lag in such investment. The question becomes, "When is such a lag intolerably long?"

Of course universal service is only one of many public policy goals for telecommunications industries, some of which conflict in real world applications. Additional goals include: (1) development of competitive markets, (2) placement of telecommunications infrastructure in all markets, (3) encouragement of technological innovation, (4) use of deregulation, lesser regulation and/or non-regulation, and (5) affordable access for essential public institutions.

Many of these often conflicting goals are directly incorporated into Section 706 of the Telecommunications Act, "Advanced Telecommunications Incentives." Congress allowed a period of time to see whether or not the competitive market can provide the needed facilities to all Americans in a timely and reasonable fashion. If after three years under the Act the FCC finds that the market mechanisms have failed, it is authorized to remove barriers to investment and promote competition.¹⁶ No funding remedies are authorized in this section.

¹⁶ On January 26, 1998, Bell Atlantic filed a petition with the FCC requesting that the deregulatory steps authorized under Section 706 of the Act be taken at this time due to the slow deployment of the advanced network features like high-speed broadband capacity over packet switched networks. This petition attempts to sidestep the review procedure contemplated in the law and foreshortens the period envisioned by Congress for the provisions that foster local competition to take effect. Many RBOCs seem to be looking for novel routes through which to provide in-region services before they receive FCC approvals under Section 271 of the 1996 Act.

In Section 254(h), on the other hand, the provision of advanced telecommunications services is allowed to be subsidized, and that subsidy is limited to specified schools, libraries and health care institutions. Other ratepayers may not directly benefit in their homes and businesses from this subsidy for higher capacity services to these institutions. There currently is no provision for direct subsidy for the general public of the higher capacity services when provided to their homes and small businesses. In fact there are price disincentives built into accessing the Internet at low speeds such as an increase in the subscriber line charge for subscription to a second line for modem connections. While this higher subscriber line charge is based on cost and is a means to limit the size of the support funding for basic lines, it is nonetheless an example of how the Universal service goals for basic and advanced services can operate in conflict.

Network traffic directed to use ISP services is currently exempt from application of interstate access charges regardless of its jurisdictional pattern. Practically, this policy results in the assignment of most ISP traffic to local usage, thereby shifting the relative usage and jurisdictional costs of this traffic to the states. A more meaningful jurisdictional assignment of Internet traffic should reflect the realities of the shared network facility. Lacking that, there appears to be an implicit subsidy from intrastate service for some ISP traffic when one compares it to treatment of similar IXC traffic. If the FCC continues to exempt ISP traffic from explicit interstate access charges, it must develop an explicit interstate subsidy mechanism, as required under the 1996 Act, to replace the current implicit subsidy based on a jurisdictional shift of the traffic to local.

Consideration of universal service objectives and access charge reform objectives must go hand-in-hand if regulators are to prevent the opportunity for arbitrage inherent in the current melange of historical pricing policy and forward-looking market objectives. What we find today in the Internet and its access providers is a hybrid of services and technologies that frustrate application of traditional regulatory paradigms. The Internet and its interplay with local telecommunications networks displays carrier, enhanced service provider, and broadcast media attributes. Therefore, the categorization of ISPs as a distinct class of customers from traditional IXCs may be a necessary interim step to achieving a compensation model that is acceptable today for application to Internet access over the PSN — and possibly, soon thereafter, to all interconnects with the local network for origination and termination of telecommunications transmissions.

Under the 1996 Act, subsidy for advanced telecommunications and information service capabilities is allowed only when they are being deployed in the networks of telecommunications carriers and the services are being subscribed to by a substantial majority of residential customers. Such a subscription level would make these services eligible for consideration for inclusion in the definition of services supported by the federal USF. The demand of the institutions eligible for support under Section 254(h) for such advanced telecommunications services over the PSN is being diverted to private connections that have been made more affordable by the subsidies under that section. This leaves a smaller total demand on the PSN over which to spread the costs of such services. This results in higher prices which further reduce residential demand for the PSN-based services. Therefore, to the extent that demand for

advanced telecommunications services is diverted away from the PSN by private connections, the inclusion of advanced services in the definition of universal service will be delayed. In some rural and low-income or high cost areas this may delay the delivery of access to information technologies and services.

Lastly, states are authorized under Section 254(f) to develop additional definitions and standards to advance universal service within a state as long as they are funded so as not to rely on the federal USF mechanisms. Advancement of Internet accessibility through higher speed connections to homes would require greater bandwidth than is supported under current FCC USF rules. This appears to leave states to fund any general advancement in data speed connectivity on the PSN from in-state sources. This burden is exacerbated because states have to bear the cost of infrastructure necessary to process Internet traffic which in turn has been encouraged by the implicit subsidy inherent in the ISP exemption.

Should ISPs Contribute to the Universal Service Fund?

There is a continuing controversy over using universal service funding to make advanced services for Internet access and information services ubiquitously available at affordable prices. That controversy also spills over into the issue of whether ISPs can and should contribute as "telecommunications carriers" to federal universal service programs. USF funding therefore ties back to the ongoing policy debate regarding the intent of the Act and the effect of the FCC's exemption of the ISPs from access charges, effectively declaring them end users rather than telecommunications carriers. Definitions are evolving regarding what is an end user, a service, a facility, and a carrier. Regardless, ISPs benefit from the subsidies for advanced services to the institutions designated in the Act when those subsidies make it possible for those institutions to use their services. In addition there is a blurring of the definitions of data, voice, and video when it comes to telecommunications applications. The Internet is capable of carrying voice transmissions and entrepreneurs are attempting to fully tap that capability and that market. As beneficiaries of subsidies to institutions accessing the Internet, and due to their public offering characteristics, it can be argued that ISPs should share in the cost of subsidizing services that are deployed to access the ISPs' services.

The Telecommunications Act states in Section 254(d) that every interstate telecommunications carrier shall contribute to the fund with equity and nondiscrimination. The FCC's previous exemption of Internet service providers from the "telecommunications carrier" designation for public policy reasons made sense at that time, but may prove inconsistent with the application of the Act's principles of explicit rather than implicit subsidization for universal service. Redefinition of ISPs as a distinct class of carriers and application of some form of economically based access charges and assessment for USF purposes could end this historical subsidy to ISPs and make them contributors to the explicit subsidies that promote use of their services. If the legal distinction between carriers cannot be made for purposes of applying access charges, another alternative may be to go ahead and assess ISPs and provide universal service funds directly to the ISPs to offset the charges.

V. Conclusions

At its inception and for many years thereafter, the PSN carried only voice communications. Growth in data transmission in recent years has resulted in a network that is heavily used for different types of communications. The current technology used for transmission of voice does not appear to be optimal for data. It is imperative that all participants in the telecommunications market, including regulators, have a clear understanding of how the PSN interrelates to the data network and how voice and data telephony are converging.

From a technical point of view, it is important that the PSN start migrating to a network which is data friendly. While it is understood that the PSN of today needs to undergo some fundamental changes to achieve this goal, we should also understand that all of the necessary changes do not have to occur on what is typically termed "the PSN." For instance, data traffic could be diverted onto a separate, data-friendly network for delivery to the Internet backbone by adding switch adjuncts into the network. Technology such as xDSL could also be employed in the loop to provide the premises connections which would permit high transmission speeds, thus keeping the last mile from being the choke point in data transmission. Many technologies could and will be used to provide quality data transmission capabilities in the future.

To make the transition to the data-friendly network will involve capital outlays. It is not enough that the Internet be able to process data. The loops and switches of the PSN must also be capable of doing so. Given that there is little compensation today for the increased traffic already traversing the network, due at least in part to the ISP access charge exemption, carriers may not be willing to make the investments needed to upgrade the network without a reasonable expectation of capital recovery. Because the FCC has determined that this investment for network upgrades will not be recovered through access charges paid by the ISPs, it is important that we devise some means to fund transformation of the PSN from primarily a voice network into one which can process any type of traffic desired, whether it be voice, data, or video. This funding could come from the end users who call the ISPs, the ISPs themselves, or the universal service fund. Of course we must always be careful not to fund technological and pricing developments which will occur naturally. However, we must weigh this concern against whether the pace of technology development is acceptable when a large segment of society may not be provided timely access to advanced telecommunications technologies.

PSN traffic and advanced telecommunications infrastructure are evolving symbiotically. In recognition of this, costs imposed on the PSN by those accessing the Internet should be equitably shared among the originators, conveyors and recipients of these communications in a manner that promotes technological innovation, network reliability and service quality, infrastructure investment, competitive markets, and ultimately, universal service. Numerous controversies have arisen regarding jurisdictional cost allocations, application of access charges or other local pricing options, payment of reciprocal compensation, and receipt of and

assessment for universal service funding for PSN facilities. These controversies may be resolved equitably, vis-à-vis all telecommunications carriers and end users, if they are addressed systemically with recognition for their interplay. By seeing these controversies in focus in this paper, regulators and public policy makers may be able to avoid the perpetuation of some of the seemingly endless applications to the evolving PSN of inadequate and piecemeal fixes to often outmoded pricing and policy models. Such refreshed vision may engender innovative options and perspectives that otherwise might not be considered.

In summary, the telecommunications network is undergoing a transformation. It is imperative that the public continue to perceive the network as seamless. While it may be that several networks will be used to deliver the telecommunications services of tomorrow, all of them will have to interact to connect all users. Viewing the networks separately, without taking into account how they relate to each other in a unified communications system, would jeopardize the potential they hold to provide benefits for all consumers and to society as a whole.

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Clogged phone lines a safety concern

By HAVEN ANDERSON
Democrat Staff Writer

FARMINGTON — When Donna Rome picks up her telephone during evening hours, she should be pleasantly surprised to get a dial tone now.

A fire recently swept through her residence at 21 Maple St., and she says firefighters could have responded sooner if she had been

able to get through on the telephone.

Ms. Rome's home was destroyed in that fire, but, thankfully, no one was injured.

The Public Utilities Commission and Bell Atlantic say the problem lies with the popularity of the Internet. Telephone companies have had trouble keeping

up with the number of lines needed to serve Internet users, according to commission spokesmen.

Amanda Noonan of the PUC said the busiest time for Internet use is between 5 p.m. and 9 p.m.

"People just stay on there for hours, unlike a three- to four-minute phone call," said Forrest Livingston of the commission.

Bell Atlantic has been working to solve the problem since last year. "This is a nationwide problem," said Erle Pierce of Bell Atlantic. According to Pierce, Farmington — as well as the entire Tri-City Area — has been affected in the last several months, and equipment has already been ordered to increase the number of lines.

But, he said, because of the national Internet phenomenon, manufacturers are not able to make equipment fast enough to meet the country's demand.

According to Pierce, the high number of users has affected availability of circuits, backed up equipment manufacturing orders, and caused customer discontent in the entire New England area, including particular areas in Maine and Massachusetts.

"Internet service is the fastest growing telecommunications business in the state of New Hampshire," he added.

Pierce said Bell Atlantic decided not to wait for new equipment to arrive before acting on the problem in Farmington. The company has rerouted calls to WorldPath, a local Farmington Internet provider, and has added 25 percent more lines. "And since then, the problem has been solved," Pierce said.

Additional circuits were added to the calling area between Rochester and Dover in November, to alleviate busy signals for telephone and Internet users.

Stephen Vial, one of the owners of The Teleconnection, which provides Internet service for the Seacoast, said that late last year many of his customers had problems logging on for service. He reported that as many 35 new customers were signed up daily.

MV Communications, an Internet service provider based in Manches-

Foster's Daily Democrat, Dover, N.H.
Monday Morning, February 16, 1998

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ter, with about 2,500 and 3,000 customers statewide, reported that the company has been supplied with 20 to 30 new lines to serve the Dover area.

"We've also placed orders for additional lines in Manchester," said customer service representative Rob Henney of MV Communications. Henney said the company has had difficulty in filling its equipment order promptly and "we are looking at other possibilities other than Bell Atlantic, but that hasn't been worked out," he said.

Pierce said Bell Atlantic doesn't make the equipment required — it provides service.

Pierce said the WorldPath service line has been transferred from Farmington to Rochester. By transferring the lines, town residents and WorldPath customers will readily have access to a telephone line.

According to WorldPath Manager Kathy McMahon, the problem of heavy usage has been prominent in recent months. She said about one quarter of the company's telephone lines were taken away before restored back to 100 percent, not including the addition of 25 percent more lines.

"When it came down to emergency situations it was addressed very quickly by the phone company," she said.

In January, Farmington police Sgt. Kevin Willey filed a complaint for himself and the department. He said the problem was promised to be remedied by Bell Atlantic.

Pierce said less than one percent of residents will experience a dial-tone delay now that the problem has been solved. The situation was addressed by Bell Atlantic at no charge to WorldPath.

He also said when the new equipment arrives, expected by the end of this month, it will be installed, solving the problem permanently.

"We also need to know when heavy usage enters an area," he said, in order for the company to be prepared to handle traffic on the telephone line.

WorldPath reports a customer population of about 5,000 with a coverage area from Dover north to the Waterville Valley area.

EXHIBIT D

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April 20, 1998

BY FEDERAL EXPRESS

Mr. Thomas P. Getz
Executive Director and Secretary
New Hampshire Public Utilities Commission
8 Old Suncook Road
Concord, NH 03301

Re: January 28, 1998 Disconnection of WorldPath Internet Services Lines

Dear Mr. Getz:

On behalf of WorldPath Internet Services, this will respond to Bell Atlantic - New Hampshire's ("BA's") April 3, 1998 letter concerning its January 28, 1998 disconnection of tariffed business lines serving WorldPath in Farmington. BA's failure to heed accurate traffic forecasts for the Farmington Central Office led to dialtone delay posing a serious public safety risk to the Farmington community. To rectify its lapses, BA disconnected WorldPath's lines on short notice, causing significant inconvenience to WorldPath's operations and to its Internet access customers. BA's attempts to deflect responsibility for its oversights by blaming WorldPath — a BA customer itself — do not mitigate BA's serious New Hampshire network deficiencies.

BA's letter appears to blame WorldPath for the network congestion that led to serious dialtone delays in Farmington.^{1/} The insufficiency of BA's Farmington network was due to BA's failure to heed the accurate demand forecasts for BA's facilities that WorldPath long before provided to BA, not because WorldPath offers a service that has proven attractive to numerous BA end user customers. WorldPath's use of BA's business lines is consistent with BA's tariff. Consequently, WorldPath is entitled to expect that BA can provide its tariffed service. Unfortunately, BA is not responding adequately to demand for its services. In the spring of 1997, WorldPath provided BA with an accurate demand forecast for tariffed BA business lines. BA was at all times aware of the demand for its services but did not act to meet demand. Certainly, BA had to take some action to

^{1/} BA states that "WorldPath, an internet service provider, certainly knew and understood the probable impact its services would and in fact did have on the BA-NH public switched network." BA letter at 5.

remedy the dialtone delay in Farmington. That BA needed to disconnect WorldPath on an hour's notice when it had been long aware of the insufficiency of the Farmington switch is unacceptable.^{2/}

WorldPath confirms that BA returned WorldPath's 24 disconnected lines to service on or about February 4, and honored an overdue commitment to install an additional 24 lines. As noted in our January 30 letter to the Commission, BA did not include WorldPath in technical discussions concerning rerouting WorldPath lines to return them to service. Indeed, BA did not substantively respond to WorldPath inquiries about disconnection for two days. BA's assertion that "once WorldPath rejected other service offerings, the company began engineering activities to divert WorldPath's traffic to its Rochester exchange" is misleading.^{3/} BA preferred that WorldPath order more costly ISDN lines to serve its customers instead of the tariffed business exchange lines WorldPath currently uses. BA cannot blame WorldPath for legitimate uses of tariffed business lines, the majority of which WorldPath has used since September 1997. Moreover, it is not BA's prerogative to dictate that WorldPath purchase more expensive service when less costly offerings are available.

BA's implication that WorldPath and Union Telephone Company somehow conspired to congest BA's network with a WorldPath point of presence in BA's Farmington exchange is fanciful.^{4/} As BA well knows since it currently offers Internet access in Manchester,^{5/} customers demand Internet access through the use of a local call. BA and Union serve different extended calling areas. WorldPath uses a point of presence in Farmington to serve customers in the Farmington extended calling area through use of a local call. Similarly, WorldPath serves customers from a point of presence in Union's territory to serve Union's end user customers through use of a local call.^{6/} That BA is the monopoly provider of local exchange service in Farmington, which Union does not serve, is beyond WorldPath's or Union's control.

^{2/} BA's quotation of WorldPath's manager Kathy McMahon from the Foster's Daily Democrat is taken out of context. See BA letter at 5. Ms. McMahon credited BA with acting quickly to alleviate dialtone delay once Farmington public safety was threatened. She did not attest to the reasonableness, prudence or fairness of BA's actions.

^{3/} BA letter at 2.

^{4/} BA letter at 5.

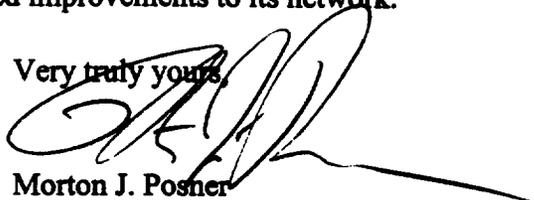
^{5/} See attached Bell Atlantic Internet Solutions Commercial Availability Schedule.

^{6/} In WorldPath's experience, Union offers better prices and service for similar telecommunications offerings. WorldPath also understands that Union does not wait until public safety is at risk before adequately provisioning its network to provide tariffed services.

Mr. Thomas P. Getz
April 20, 1998
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WorldPath commends the Commission on its effort to work with BA to address dialtone delay in BA's serving areas. WorldPath hopes, however, that BA will not wait until public safety is at risk again before it makes further needed improvements to its network.

Very truly yours,



Morton J. Posner

Counsel for WorldPath Internet Services

Enclosure

cc: Victor D. Del Vecchio, Esq.
E. Barclay Jackson, Esq.
Kathryn Bailey
Forest Livingston
Amanda Noonan
Michael Holmes, Esq.
Eric J. Branfman, Esq.

Bell Atlantic Internet Solutions

Availability

Bell Atlantic.net™ Access Sites**Bell Atlantic.net access numbers are available in the following areas:**

- Washington, DC
- Virginia
- Maryland
- Pennsylvania
- Delaware
- New Jersey
- Maine
- New Hampshire
- Vermont
- Massachusetts
- Rhode Island
- New York

ISDN numbers are the same as the Analog phone numbers with a few exceptions. If you need additional assistance or more information, please call customer support at 1-800-567-6789.

Washington, DC

Internet Access Site	Analog Phone Number*	GSPs Available
Arlington	703-875-3920	ICon
Gaithersburg	301-527-2980	ICon

Delaware

Internet Access Site	Analog Phone Number*	GSPs Available
Dover	302-741-2552	ICon
Georgetown	302-854-0454	ICon
Newark	302-369-2493	ICon

Beverly	978 720-9703	IGN
Mansfield	508-594-1463	IGN
Marion	508-748-6003	IGN
Quincy	617-691-1443	IGN
Newton	617-454-3223	IGN
Pittsfield	413-496-6503	IGN
Springfield	413-543-7603	IGN
Templeton	978-939-4603	IGN
Worcester	508-926-1003	IGN

Maine

Augusta	207-626-5103	IGN
Bangor	207-990-9803	IGN
Eliot	207-748-4003	IGN
Lewiston	207-753-2503	IGN
Presque Isle	207-764-950 3	IGN
South Portland	207-842-5203	IGN

New Hampshire

Hanover	603-640-1903	IGN
Manchester	603-634-0803	IGN
Peterborough	603-924-2803	IGN

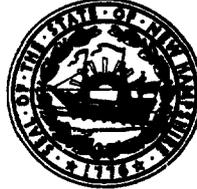
Vermont

Burlington	802-651-5403	IGN
Montpelier	802-371-5203	IGN

Rhode Island

EXHIBIT E

STATE OF NEW HAMPSHIRE



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PUBLIC UTILITIES COMMISSION
8 Old Suncook Road
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May 18, 1998

Mr. Victor D. Del Vecchio
General Counsel-New Hampshire
Room 1403
185 Franklin Street
Boston, Massachusetts 02110

Re: WorldPath Emergency & Dial Tone Delay Improvement

Dear Mr. Del Vecchio:

I have reviewed your letter dated April 3rd detailing the Bell Atlantic account of events leading up to the emergency disconnect and subsequent restoral of 24 WorldPath lines in Farmington, New Hampshire. I have also reviewed the April 20, 1998 WorldPath response to your letter, which was also copied to you. I have discussed these responses with Staff as well as recent actions and proposed future Bell Atlantic plans to prevent unacceptable levels of dial-tone delay.

Certainly there are variations in the accounts of this matter reflecting both the actual knowledge of events known by the parties and the perspective differences reflected by customer versus provider viewpoints. Arbitrating or reiterating the events in Farmington will not accomplish the goal of the Commission in this matter which is to prevent unreasonable future dial tone delays or the emergency removal of services.

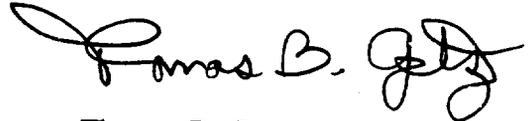
Bell Atlantic has demonstrated in its account of the Farmington emergency and in subsequent reports submitted to the Staff that it has the capability of monitoring dial tone delays and terminating blockages. Given the commonality of central office equipment with #5ESS Technology deployed throughout Bell Atlantic, the Commission believes that components needed to address problems should be readily available.

The Commission appreciates the efforts of Bell Atlantic to review monitoring and action plans with Staff, to develop reports to monitor dial tone delays and the technical explanations provided by Switching Director-Michael Fraine. The Commission expects Bell Atlantic will continue to monitor this diligently and prevent emergency disconnection of service in the future.

Mr. Victor D. Del Vecchio
May 18, 1998
Page -2-

Thank you for your continued efforts in working to resolve this issue which potentially threatens the quality of service in several Bell Atlantic exchanges.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas B. Getz". The signature is fluid and cursive, with a large initial "T" and "G".

Thomas B. Getz
Executive Director & Secretary

CC: Morton Posner, Esquire
Michael Holmes, Esquire
Amanda Noonan
Michael Cannata