BOOK I

Info-Scandal:
Highway to Nowhere

Chapter 1 Promises, Promises: The Future is Always.

It's the spring of 1993 and the fiber-optic Info Bahn is just a few months away... The April 12th, 1993 Cover of Time Magazine proclaims: "The Info Highway: Bringing a Revolution in Entertainment, News and Communication: Coming Soon to your TV Screen...". (6) The story continues:

> "It's not here yet, but it's arriving sooner than you think...Suddenly the brave new world of videophone and smart TVs that futurists have been predicting for decades is not years away but a few months... We won't have to wait long. By this time next year, vast new video services will be available at a price to millions of Americans." [emphasis added]

Welcome to the Information Age: Again and again... and again.

The Information Age has always been 'just around the corner" with words, such as "soon", "next year", and "tomorrow" describing when this miraculous use of technologies and networks will change the world for the better. As best as we can tell, the term **"Information Age"** was coined in the 1960's by AT&T's public relations department, and it is a polyglot phrase that can mean almost anything you can think of. The author is reminded of meetings in the 1980's that used the term "**Information Products"** to describe everything from 900 number sex lines to home shopping.

"Information Theory", the basis for terms using Information-Anything, was developed at Bell Labs in 1948 almost 50 years ago. One of Information Theory's principles is that digitizing something turns it into all ones and zeros — and to a computer, well, that's all just information.

The Information Superhighway, sometimes called everything from the "Info Bahn" to the "I-Way", like the Information Age, is another polyglot term. Coined by Vice President Al Gore in the 1970's. It has come to describe the future communications network and applications, from the fiber-optic conduit to the Information Age products and services carried over the wires and through the air.

As Vice President Gore put it: (7)

> "When I first introduced the concept back in the 1970's, the only company that showed any interest at all was Corning Glass, which, for some mysterious reason saw the potential in a nationwide fiber-optic network. (National Journal, 3/20/93)

Superhighway Feeding Frenzy Fuel: (The I-Way Go-Go Years)

By the early 1990's a confluence of events brought what can only be described as a techno-crescendo of I-Way dreams. It was fueled, in part, by an aggressive administrative policy lead by Vice President Gore to get business to build the I-Way. The telecom and cable giants saw this as the something that would make them barrels of new money, but also give them leverage to remove regulation on the federal, as well as the state level.

The other parts that would supposedly make the I-Way dreams real was the proposed mega-deals of 1992-1994, such as Bell Atlantic and TCI for $33 billion, or Southwestern Bell and Cox, and US West and Time Warner. They were all "a sure thing". Who could have doubted that $90 billion dollars of new marriages and partnerships wouldn't bring the future that much faster. Even after the TCI deal was history, Ray Smith, CEO of Bell Atlantic, was still in bravura mode. Interviewed in Wired Magazine, 2/95, he said: (8)

> "I would say that by the year 2000, we'll have 50% of the cable business. No doubt about it. Which is why the cable companies are in a panic. Meanwhile, the cable companies won't have even 5% of the telephone revenues in their best markets."

There were a few people with a bit more reality in their assessments of the Info Highway. Sumner Redstone, Chairman of Viacom, (a conglomerate which now owns Paramount, Blockbuster, cable channels and Viacom Productions) spoke at the National Press Club in October, 1993. (9) He said:

> "It seems to me not to be a 500 channel information Superhighway but rather a road to Fantasy Land. The assumption that individuals will

> suddenly transform themselves into renaissance men and women with the potential of information and entertainment is an understatement.
>
> "While we may anxiously await that fully-interactive, individually tailored, all encompassing home entertainment and information appliance with the greatest anticipation, the truth of the matter is that plain old television is going to be around for a long time.
>
> "It's gonna cost a lot more, It's gonna take a lot longer, if we ever get there, and there is no guarantee that the customer is willing to pick up the price tag."

But Redstone's concerns were all drowned out by the roar of the politicians and pundits' noise.

And the Promises?

According to Baby Bell annual reports and press announcements from 1993-94, by 1997 there would be almost 20 million households wired to the all digital, 500 channel, full-motion video network, 45 million by the year 2000. For example:

US West, 1993 Annual Report (10)

> "In 1993 the company announced its intentions to build a 'broadband', interactive telecommunications network... US West anticipates converting 100,000 access lines to this technology by the end of 1994, and 500,000 access lines annually beginning in 1995." [emphasis added]

Ameritech Investor Fact Book, March 1994 (11)

> We're building a video network that will extend to six million customers within six years. [emphasis added]

NYNEX, 1993 Annual Report (12)

> We're prepared to install between 1.5 and 2 million fiber-optic lines through 1996 to begin building our portion of the Information Superhighway. [emphasis added]

And we are not talking about the Internet or World Wide Web. The Superhighway, based on fiber-optics, is "broadband", able to supply hundreds of times more information for enhanced interactive services, while the Net is 'narrowband', based on available phone wiring. It's the difference between a Ferrari and a skateboard.

And the promises were that the Info Highway would fix everything — Tele-Medicine, Tele-Learning, even new jobs. For example, Deloitte & Touche's "New Jersey Telecommunications Infrastructure Study, 1991", dubbed "Opportunity New Jersey" (a Bell Atlantic state) proclaimed that the Info Highway was: (13)

- "essential for New Jersey to achieve the level of employment and job creation in that state"
- "advance the public agenda for excellence in education"
- "improve quality of care and cost reduction in the healthcare industry".

Meanwhile, in 1993, Ray Smith, CEO of Bell Atlantic, exclaimed at the "Electronic Summit" conference: (14)

> "Imagine a button on your TV that you push to get your pizza, without the fuss and problems.
>
> "Bell Atlantic will have the first virtual VCR, and 100,000 people by the end of the year (1993) buying things over transactional services. We will never get into the car and jump down to the store once we get used to the idea of any kind of network offering."

In fact, in Bell Atlantic's 1993 Annual Report, the company announced they were the "leaders" of the Info Bahn, and that they would be spending $11 billion dollars. (15)

> "First, we announced our intention to lead the country in the deployment of the information highway... We will spend $11 billion over the next five years to rapidly build full-service networks capable of providing these services within the Bell Atlantic Region." [emphasis added]

Another Bell's 1994 annual report was even more bullish than Ray Smith. Pacific Telesis' President Philip Quigley boldly announced that they were going to spend a whopping $16 billion dollars. (16)

> "In November 1993, Pacific Bell announced a capital investment plan totaling $16 billion over the next seven years to upgrade core network infrastructure and to begin building California's "Communications superhighway". This will be an integrated telecommunications, information and entertainment network providing advanced voice, data and video services. Using a combination of fiber optics and coaxial cable, Pacific Bell expects to provide broadband services to more than 1.5 million homes by the end of 1996, 5 million homes by the end of the decade." [Emphasis added]

Unfortunately, almost nothing was ever built and promises were never kept.

> **Today there are no full-motion-video, fiber-optic homes, except for tests, and the telephone companies cannot even supply two telephone calls over the same wire.**

US West told the New York Times (9/26/1995), it can't be built today. (17)

> "US West said it had ended its experiment into interactive television shopping because it cost too much and the technology was out of reach... John O'Farrell, president of US West Interactive Services Group said the technology to create two-way television and sophisticated programming production was years away and more expensive than originally thought.

But the hype continues, regardless of the reality. For example, even though Pacific Telesis stopped all of its major highway plans and never spent the money, a press release from SBC Communications, April 1st, 1997, touting their purchase of Pacific Telesis, stated that Quigley led Pac Tel's $16 billion broadband Info Bahn project. (18)

> "During Quigley's tenure, Quigley led PacTel's comprehensive $16 billion network redesign program, which involved construction of a broadband information superhighway." [emphasis added]

A History of the Techno-No-Shows

Unfortunately, almost all wonderous techno-color visions of the future rarely comes into focus, much less shows up when they're supposed to. Take a look at the next quote which discusses the first round of Information Superhighway rollouts, the cable rollout of the 1970's. Here, the writer bemoans the fact that the two-way interactive world, promised in the 1970's, still hadn't arrived by the mid-1980's..

> **"March 4, 1984** "Ten years ago, when cable was young, it was envisioned as a technological wonderland, a purveyor—through an "ultimate box" of 108 channels atop the television set—of a lavish menu of two-way services, home banking, and tele-shopping, home security and energy monitoring, video games, polling, news and sports scores on demand. Some telecommunications experts predicted that the revenues of such services would eventually dwarf the sums realized from cable's more conventional home-entertainment fare." (19) The New York Times, Sandra Salmans, 3/4/84

But hype is a timeless thing. For example, the next quote, this time about John Malone, president of TCI Cable, echoes almost the same promises, almost 10 years later.

> "**October 14, 1993** "In announcing the $33 billion deal with Bell Atlantic, the cable industry entrepreneur John Malone held out the vision of a single powerful box on top of each home television set that would combine the diverse streams of information that now flow separately into the home: telephone calls, television shows, video rentals, newspapers, and even books." (20) (New York Times, John Markoff, 10/14/93)

I've always been amazed that hype, I mean history, keeps repeating itself, rewriting itself to be current. I remember as a teenager going to the 1964 World's Fair and visiting an AT&T videophone booth, seeing and talking to friends in other enclaves and listening to the words of the telephone company stating videophones would be available by the 1970s. Personal vision aside, the Information Age and its associated products, services, and "dramatic" changes have always been driven more by hype than by a sense of deja vu. And the hype keeps changing, modifying itself to fit the product that is being hyped for the year.

In fact, the original Bell vision of the I-Way has been around since the 1980's. Here's some of the RBOCs on Integrated Service Digital Network's, (ISDN) potential from the 1980's. Notice that the words "Information Superhighway" can be almost substituted for ISDN without missing a beat.

Southwestern Bell, **1986** Annual Report (21)

> "At the forefront of new technology is ISDN. Scheduled for commercial availability in 1988, ISDN will revolutionize day-to-day communications by allowing simultaneous transmission of voice, data and images over a single telephone line.
>
> "With ISDN customers will have the potential to access videotex, telemetry, alarm services, sophisticated calling features, teleconferencing much more economically than they can today."

Pacific Telesis's **1988** Annual Report states that ISDN will help California compete in the 21st. century's global economy. (22)

> "To accommodate growing voice and data traffic we've nearly completed digitization of Pacific Bell's interoffice circuits. By testing and implementing advanced technologies like ISDN — which will allow customers to transmit digitized voice, text, video and graphics simultaneously over ordinary Pacific Bell lines — we're preparing California to compete in the 21st Century global economy."

It is interesting to point out that ISDN, a technology that could have been rolled out in the 1980's, waited until the 1990's before any actual implementation ever occurred— and today it's still broken, according to many in the New Media/computer/internet businesses. (We will address ISDN's roll-out problems in Chapter 6 subtitled, "It Still Does Nothing")

Sometimes, the hype and reality do meet, but the time and capital it takes to fulfill a vision can be decades, not years. Take, for example, this quote from a Scientific American Book titled "Information" 1966. Even in the early 1960's, computers connected by public telephone networks were already being envisioned by John Mc Carthy. (23)

> "By 1961 John McCarthy, then Professor of Computers at Stamford University, envisioned the 'Public Utility Information System' which would interact with consoles in homes, schoolrooms, and offices. 'Everyone will have better access to the Library of Congress than the librarian himself has. Any page will be immediately accessible. Because all payment will depend upon usage, all levels and kinds of tastes can be accounted for'."

Sound Familiar? It's almost today's online services, though the billing issues, being able to bill for usage, still has not been adequately addressed or solved with the World Wide Web, three decades later.

Evolution, not Revolution

Evolution, not Revolution is the way most technologies work. In fact, it could be argued that data has been traveling through the networks long before the 60's. For example, "tickertapes", "telexes", "teletypes", and a host of other systems have been delivering information to the business markets since the 1920s. And one can argue that the "telegraph", from the 1800's, was one of the first systems to send a kind of digital data, dots and dashes, in the form of Morse Code, over an analog wire.

And now, of course, the Internet has superseded the "Information Super-highway's" domination of the press's infatuation with the "new", which started around 1994. A chart featured in Interactive Age called the "Superhighway Hypemeter" found that the number of newspaper stories (tracking 54 national and regional newspapers)

carrying the term "Information Superhighway" and similar metaphors, dropped almost 50% from a high of 1,200 stories in January 1994, down to about 650 stories by September, 1994.

Also, articles proclaiming Internet's victory over the Info Bahn started to appear regularly. For example, one article "How the Propeller Heads Stole the Electronic Future" by Steven Levy (New York Times, 9/24/95) stated that "The silver haired media monopolists follow their 500 channel dream. They haven't reckoned with the 500 million channels of Netscape and the Internet."(24) In exclaiming the demise of the 500 channel universe, Levy states that the real new Information Highway is the Internet.

> "It (the Internet) is based on unlimited channels of communication, community building, electronic commerce and full-blown version of interactivity that blurs the line between provider and consumer. In short the Information Superhighway, font of a thousand bad metaphors, is already here."

And the same hype that clouded the fiber-optic rollout has been in vogue when it comes to Internet prognostications. An article in the New York Times summarized two meetings of industry pundits showing that the revolution was in full swing, at least in the mind of the cognoscenti. Peter Lewis of the New York Times, 8/28/95. stated: (25)

> "The revolution will be televised. And if some of the deepest thinkers in cyberspace are to be believed, the revolution will also be e-mailed, faxed, uploaded to a World Wide Web site, catalogued in computer databases, routed on phone lines, encoded on CD-ROM disk and tattooed on billions of digital identification cards.
>
> "According to many of the digital revolutionaries, the information age will transform the political, social and economic foundations of the planet just as surely as the agricultural and industrial revolutions did, only much faster."

One telecommunications lawyer, Peter Huber, stated that the Internet will completely change commerce. (26)

> "We'll see a revolution in the infrastructure of the marketplace by eliminating the middleman sector of the economy, the Internet will enable global markets to be more efficient that ever before and we should see markets accelerating and improving beyond recognition."

At another conference, sponsored by the Aspen Institute, the idea that the world is about to dramatically change was reinforced by numerous speakers. For example, Jeffrey Eisenach, an economist who founded the Progress and Freedom Foundation stated: (27)

> "What we are headed for now is a world in which a very small percentage of workers work in manufacturing, some proportion of the population works in knowledge work and the rest are in service."

Nathan Mythrvold, chief technologist for Microsoft, said even communities will change. (28)

> "In the short run, we're talking about communities online. The long term effect of all this is to restructure our physical communities."

Unfortunately, most of these soothsayers don't mention the fact that numerous failures of online services in the mid-1980's were in large part, part of the developmental life of the current online markets, both in terms of initial customers, as well as the backbone of the new media community. Called "Videotex", or "Videotel", or 'Gateways", and based on the successful French "Minitel", a national rollout of online services used home terminals supplied for free by the phone company as the connection, instead of a computer; these services supplied everything from chat services to the ordering of products.

It should be remembered that it was this community of US users, a techno-savvy group, that was using e-mail and data/text services, such as "Dialog", that was the basis of all of the original online customers — "Before you were born".

Whether the current Internet and the Web will reach their full potential, or just be more fade & fashion than money maker, is still too early to tell. But this fiber-optic fairy tale and its related customer overcharging doesn't start in the present, but back to the

early 1990s, when Al Gore was finally laying out his vision of the future to a very eager group of listeners.

Chapter 2 What Was the Information Superhighway, Anyway?

Let's start with the words of the inventor, Vice President Gore. His definition from 1993 described a series of specific applications and combinations of technologies and regulations, which, taken as a whole, was perceived as both innovative and the right path to take, over the next two decades. (29)

Our definition of the I-Way is the Gore vision — a broadband, fiber-optic, fully interactive, fully digital, fully competitive, full-motion video, communications network. Let's define and explain some of these terms.

Definition: Broadband: To understand "broadband", think of a water hose with the width of a pencil, compared to a hose with a width of a large sewer pipe. Copper wire is the equivalent of the pencil, while the sewer-pipe width is compared to fiber. A great deal more water can go through the sewer-sized hose and at much higher speeds. Similarly, a great deal more data, such as full-length movies, or Internet information can travel over fiber at higher speeds.

Definition: "Bandwidth" describes the size of the pipe, or the speed that the data is flowing. More bandwidth, more information.

Definition: Digital vs Analog: Forget the science. Digital is always considered the better technology. Analog should be thought of as "older".

Definition: Full-Motion Video The term "full-motion video" refers to the network being able to deliver a picture analogous to current television, which delivers a clear, smooth motion picture. with a full spectrum of colors. This is in contrast to most videophones today, (i.e. a system that delivers a picture of the person you are taking to) where the picture may be jerky, or the voice is out of sync, and delivered usually, in black and white. Full-motion video requires a massive bandwidth and therefore can not be done over copper wire without a great deal of expensive technology.

Definition: "Interactive" A service that allow the customer to interact with the content— play a game, select a camera angle in a sports event, or participate in a class. It also is a "transactional" service, meaning that the customer can order a product or service.

The Bottom Line - The I-Way Wiring Plan

The foundation of the Info Highway was its wiring plan: to upgrade the existing, mainly copper wiring and reciprocal network switches to glass fiber wire. This would be ubiquitous throughout America, connecting every home, and every health facility, school, business, etc.

Today, almost all households in America still use copper wires.

Interim wiring strategies can also be used, such as using both "coaxial cable", which is the wiring most common in cable systems, or enhanced copper wire (using smarter technology over the same current telephone wiring, such as ISDN, or ADSL). (In 1998, the pragmatic realities are that while fiber-optics will always be able to deliver more bandwidth, copper wiring and cable coax are now being revisited to expand their capabilities.)

Wireless, Cordless plan: Numerous companies have talked about "bypassing" the wire based services altogether, using everything from satellite technologies or Cellular and Personal Communications Services (wireless PCS) to other "spectrum" services, such digital FM radio services.

As we will see, wiring America is a nightmare because it requires actually replacing everything that already is installed with new wires. And even Cable systems, using Coaxial wiring needs to be redone. We'll return to this problem later.

Technologies Merging

In the Gore vision, as well as most visions of the future, there are basic streams of technologies and industries merging: (30)

- **The Networks,** which include Telephone networks, cable networks, wireless (satellite, microwave, radio, PCS), "other carriers" electric companies
- **The Equipment,** which include computers and modems, televisions, TV boxes, telephones, fax, videophones.
- **Other Technologies,** which can include cameras, security and monitoring equipment

All, or some of these, in various combinations, would play a role in the evolution and deployment of the I-Way.. For example, a movie would appear on your computer or television, depending on the room you were in.

I-Way Regulation

According to Gore, the driving regulatory forces would need to include:

- **Investment:** Create incentives for investments in the private sector.
- **Competition:** Create an environment of competition on all levels of communications.
- **Access:** Allow equal access to all competing companies to the network, and all network services have "interoperability"—the ability of all competitors to use the same standards and protocols.
- **Universal Access:** Preserve the basic tenets of Universal Service for all subscribers. Also, the Gore vision gives the rural subscriber the same service offerings as the urban subscriber.

It should be stressed that the Info Bahn's federal life was tied, in a large part, to the Telecommunications bills that Congress was trying to make into law since the early 1990's, culminating in the Telecommunications Act of 1996. Earlier versions of the bill, such as the 1993 "National Communications Competition and Information Infrastructure Act of 1993", which didn't pass Congress, was specifically focused on "promoting a national communication infrastructure to encourage the deployment of advanced communication services". (31)

There was also two other large regulatory pieces that were needed. First, changes in all fifty states to Alternate Regulations would be required. Also, the FCC enacted the "Video-dialtone" (32) ruling, allowing the Bells to go forward. To make matters even more complicated, the I-Way plans also needed to fulfill the "politicians needs" and therefore, all fifty state legislatures had to have their piece of the I-Way action. We will discuss these regulatory changes later in Book 4: "Regulators and the Laws"

And Who Would Build it?

Though there were moments that the government threatened that this would become a public works project, the RBOCs assured the government that if the right regulation passed, the RBOCs would step up to the plate and create the Info Bahn. Also, the cable companies, the long distance companies and even other utilities all made hand-waving motions that they would be building the Info Bahn as well.

Why Do It?: Benefits of the Superhighway—The 1990's

Today, the Information Superhighway is an oxymoron but seven years ago the world was aflame with excitement.

Besides the "chicken in every pot" similarities, what the Highway was and who would use it, much less pay for it, had hundreds of groups issuing thousands of studies all trying to prove their specific point. Almost every state, federal government agency, and of course lobbyists, associations, consumer groups, and the phone companies, spent hundreds of millions of dollars on research, and almost all of it self-serving.

To start, one of the most quoted reports was by the Economic Strategy Institute. Called "The Impact of Broadband Communications on the U.S. Economy and on Competitiveness" (1993), this study stated that $321 billion dollars in new growth could be expected over the next 16 years from the I-Way. (33)

> "Economic growth in the United States would be greatly accelerated by increased private sectors' investment into broadband communications. Creating a more favorable environment for such investment could enable U.S. industries to create as much as $321 billion new GNP growth and 0.4

> percent to annual U.S. productivity growth over the next 16 years—about the time currently needed for two cycles of investment in new telecommunication infrastructure. The gains would come on top of the gain of $191 billion in U.S. output that is already expected if present trends in broadband investment continue."

Bear Stearns, the brokerage house, was also quite bullish on the future of the Information Highway. In a report, "New Age Media" released in 1993: (34)

> "In our opinion, we are on the threshold of a technological revolution that will sweep through all modern societies across the globe, dramatically changing the way we communicate, educate our children, access our entertainment and train our workers... The creation of a fully interactive nationwide communications network could open up the largest opportunity in history."

In fact, each group in America probably had visions that the Information SuperHighway would eventually fulfill some new, unexplored potential for their specific citizenry. However, almost all visions could be summed up by three specific models.

- **Government & State Justification Superhighway**
- **The Home "Wonderland" Model**
- **Internet Expansion Model**

The next section gives a brief explanation of each model.

Government & State Justification Superhighway

Let's start with what we call the "Government & State Justification Model" of the Information SuperHighway. This approach stated that the primary reasons to build the highway was to directly benefit Public Interest and special needs. The wiring was supposed to connect America's hospitals, schools, libraries, jails, and other government and nonprofit organizations to the American public.

Sold as a boon to education, healthcare and the creation of thousands of new jobs, this approach was carried out at both the state and federal levels — on the state level it was pitched as "bringing the state into the 21st Century" while on the federal level, it was used by the Bells and their supporters, as a major pusher of the passage of the Telecommunications Act of 1996. In fact, Senator Pressler, then chairman of the Senate Telecommunications Committee, stated repeatedly that "This is a jobs bill". (35)

To highlight how the State Justification approach was sold on the state level, we present a small portion of testimony from Lawton C. "Mitch" Mitchell, a partner at Deloitte & Touche. discussing their Opportunity Indiana study, which was done for Indiana Bell-Ameritech. He focuses on: "The benefits that arise from an advanced telecommunications infrastructure...and the implications of technological innovation on the telecommunications infrastructure of Indiana and various initiatives under way to respond to the demand for an advanced telecommunications network." (36)

The exhibit below highlights Mitchell's testimony topics and is followed by a description of some of the important areas where this Information Highway model would be the most useful — everything from education and healthcare to the economic development.

EXHIBIT 2
Deloitte & Touche Benefits of Information Highway
for Indiana Bell, 1993

- The Emerging Role of Telecommunications in Economic Development
- Health Care: The Impact of Telecom on Quality and Cost Effectiveness
- Opportunities to Leverage Telecom to Benefit Other Public Interests
  - Education
  - Public Safety
  - Telecommuting
  - The Criminal Justice System
  - Special-Needs Groups
  - Libraries and Info Services

Here's Deloitte's analysis of telephone's role in building the economy: (37)

The Emerging Role of Telecom in Economic Development

> "As the overall economy in the United States continues its transition from a traditional foundation in manufacturing toward the service-based sectors of the economy, access to information has become a major factor in the determination of competitive advantage and commercial success. More than half of the jobs in the U.S. economy are now in the service-producing sectors rather than the goods-producing sectors."

In fact, according to Mitchell, Indiana had "Almost one-half of its current employment base in industries which can be defined as telecommunications intensive." i.e. companies that supposedly spend twice the amount on their telecommunications usage. These include communications, finance and insurance, while Mitchell also adds education services, and print and publishing markets as "telecom intensive".

But it is the fixing of problems that is supposed to be the major reason to implement the I-Way. Have a problem in your school? No problem. Roll out technology. Mitchell states:(38)

> "Major problems facing the U.S. educational system today include unsatisfactory educational performance, potential teacher shortages, and budgetary pressures.
>
> "Especially within the K–12 community, educational institutions often lack the financial resources or purchase dedicated facilities to accomplish highly effective two-way interactive distance learning and other advanced educational applications that require broadband facilities.
>
> "**Distance learning** is the provision of live, interactive video instruction from a remote source. Often employing interactive video, fax machines, electronic blackboards, and other forms of media, distance learning enables teachers and students in one classroom to discuss lessons with students and teachers in distant as well as multiple locations.
>
> "Distance learning applications, which leverage advanced telecommunication services and capabilities, can help improve educational quality by eliminating the geographic constraints which have traditionally

> prevented teachers in specific fields from reaching a student audience outside their classrooms. Advanced telecommunications can be used to expand the breadth of instruction in schools, not only increasing the value and diversity of education, but also increasing student interest and participation in school.

And let's not forget healthcare. According to Deloitte, everything from reduction of costs to delivering healthcare to "less mobile citizens" will be facilitated with the Info Bahn. (39)

EXHIBIT 3
Opportunity Indiana's Impact on Health Care

The Information Highway will:

- "Reduce the cost of health care through technology applications that improve hospital, clinical, administrative, and related insurance operations.
- Expand limited availability of medical knowledge and expertise.
- Improve health care quality.
- Increase health care access for rural and less mobile citizens.
- Improve and increase home health care opportunities.
- Improve the quality and availability of health care education for practitioners.
- Send X-rays to experts realtime via broadband technology.
- Give improved health care for limited resources with telemedicine projects."

Before debating the issues at hand of using the Information Highway for healthcare or education, let's first examine the other two "Information Highways" models:

- The Home "Wonderland" Model

- Internet Expansion Model

The Home "Wonderland" Information Superhighway Model

Forget the Public Interest perspective. The Information Age is everything from home shopping to movies-on-demand (the ability to watch a movie or any program at the customers convenience). These mainly consumer services make every household into a "wonderland" of technological advances, making our lives easier. This sales pitch of the Info Highway can be summed up by a series of quotes by Bell Atlantic, Pacific Telesis, and Time Warner from the Electronic Summit, sponsored by the Academy of Arts and Sciences, 1993.

Bernard Shaw, newscaster from CNN, was the moderator. He wondered how the SuperHighway was going to be paid for: "What I'm struck by is there seems to be an unspoken assumption that peoples' discretionary income is going to be there to buy your products." (40)

Ray Smith, CEO Bell Atlantic stated: (41)

> "It already is there. If you look at the early (Info Highway) applications, those markets already exist. Already making those purchases. Home video is $17 or $18 billion, catalogs is gigantic, that is really home shopping. Games and gaming is also huge. You're talking about taking market share from other businesses, not inventing new services. They won't have to spend a single dollar more than they had to before...It's a rather sweet deal."

In another place, Smith stated: (42)

> "Bell Atlantic will have the first virtual VCR, and 100,000 people by the end of the year (1993) will be buying things over transactional services. We will never get into the car and jump down to the store once we get used to the idea of any kind of network offering."

Pacific Bell's President Philip Quigley agreed that the money was already being spent in other areas wastefully, especially in education: (43)

> "In the field of education, there is potentially significant waste and inefficiency today, and there are millions and billions of dollars that can be spent on educating our children to the modern technologies. And we can shift a lot of the hard dollars that can be redirected."

Also, the applications are quite similar for either cable to telephone companies. For example, the list of Time Warner's proposed services, from games to shopping, is straightforward, with some creativity added.

Gerald Levin, Chairman of Time Warner, stated: (44)

> "There are great opportunities for video information. Going into an auto showroom can be an intimidating experience for some. You can call up some four-wheel-drive videos, interact a little bit, then set a time to take a test drive. So there's an auto concept. There are four major areas:
>
> - video-on-demand movies
> - games
> - shopping
> - news, sports, on demand, Videotex with a printer."

In fact, Levin continued:

> "The conviction that started with our test in Queens, (named) Quantum, consumers really want choice. Starting in 1994, we will need to take one step further, which is true video-on-demand. In our case we think it's going to take about five years and one billion a year—five billion dollars.
>
> "In the short term it makes a lot of sense, so we put in an impulse-purchase box in peoples' homes."

Other sources, such as Bell South's Annual Report, 1993, begins with the phrase "The Excitement is Now." (45)

> **"Interactively — What you want, when you want it.** Many of these new services will be interactive. This means you'll have the option of controlling a network to make transactions. Select camera angles and replays. Ask a teacher a question. And compete with other viewers in tests of skill and knowledge. . .
>
> "Need to buy a present? Call up the choices on your TV, select your gift, pay for it electronically, and it arrives the next day. Want to see a movie? Order one of thousands of titles and it will be piped directly to your set. Watch it when you want. Start it, stop it, rewind, and fast forward at your command."

In another paragraph entitled "Linking the Value Chain," BellSouth makes it clear that besides transmission, the company is also going to supply the content.

> "**Content, Packaging, Delivery:** These are the links in the value chain of convergence for customers and investors.
>
> - **"Content** includes TV shows, movies, games, and a limitless array of services—shopping, education, communications, advertising, financial transactions, and information.
> - **"Packaging** means being in contact with you so it is convenient to access, simple to use, and affordable.
> - **Delivery:** Telecommunication networks, cable TV systems, and computers are the infrastructure of delivery."

So, in the "Wonderland" Model, as stated by Time Warner, Bell Atlantic, and Bell South, we are looking at gaming, home shopping, movies-on-demand, and sports and news, mainly paid for by redirecting monies already being spent.

The Internet Expansion Info Highway Model

(NOTE: NNI published a research report titled "Inter-NOT: Reality Check on Online & Internet Services", which discussed the current market and future growth and trends, 1995-1997.) (46)

There are numerous people and companies who believe that the Information Highway is really here and growing, called Internet or World Wide Web. This international, data communications network, has 10-45 million users in the US, depending on who's statistics you believe. Starting as a government project in the late 1960s, and for decades remaining mostly a network for colleges and government agencies, in 1992 it was "discovered" by the business community at large, and literally overnight thousands of companies and organizations sprung up to offer everything from cooking recipes to the latest in advanced mathematics.

This model is the poor man's Information Highway, depending on existing computers, modems, servers, and telephone and data networks. However, some believe that it will be the computer and modem that will be the new Information Highway. According to Nicholas Negroponte, Director of MIT's Media Lab: (47)

> "For interactive applications, the personal computer is going to win the battle over cable and the television box. "

While the Internet will continue to grow, and delivers many of the I-Way's original applications, it is not the Information Highway. Or at least, it is not the Fiber-optic highway — the highway you paid for.

The Info Highway — What and When

To sum up, the exhibit below highlights the original bravura of the RBOCs Info Highway rollouts, as declared in their annual reports. Ameritech stated that they were planning 1 million a year starting in 1995, while Bell Atlantic stated it would have 8.75 million households wired by the year 2000. The numbers for Bell South and SBC

communications are averages of the five companies because they never officially released their roll-out plans

EXHIBIT 4

Announced RBOC Upgraded Residential Subscribers, 1994-2000*

	1994	1995	1996	1997	Total by 2000
Ameritech	800,000	1,000,000	1,000,000	1,000,000	6,000,000
Bell Atlantic	100,000	1,750,000	1,750,000	1,750,000	8,750,000
Bell South			1,106,000	1,106,000	4,324,000
NYNEX			2,000,000	1,500,000	6,500,000
Pacific Telesis	780,000	780,000	780,000	780,000	5,500,000
SouthWestern			1,006,000	1,106,000	4,324,000
US West	100,000	500,000	500,000	500,000	2,600,000
PER YEAR:	1,780,000	4, 030,000	8,042,000	7,742,000	
RUNNING TOTAL*:	1,780,000	5, 810,000	11,840,000	19,582,000	45,740,000

(48) *Sources: Bell Annual Reports.*

What Happened Over the Last Five Years with the Info Bahn.

Today, there are no full blown, interactive, full-motion video rollouts besides "tests", and the companies have all retrenched. In fact, according to the FCC, at the beginning of 1996 there were only 4,202 residential digital lines in America— 1 Full-motion digital line in 1996 according to Interactive Age.

Here's some RBOC quotes from the last two years:

"Bell Atlantic Delays Home Video Service", Washington Post, 4/26/95 (49)

> "Bell Atlantic Corporation yesterday delayed indefinitely the home video service it had promised to introduce here and elsewhere in its mid-Atlantic service region this year."

"US West Ends Interactive Trials", The New York Times, 9/26/95 (50)

> "US West, said it had ended its experiment into interactive television shopping because it cost too much and the technology was out of reach... "

"Pac Tel Cuts $1 Billion Interactive Plan", NY Post, 9/28/95 (51)

> "Pacific Telesis Group said it will cut $1 billion over 5 years from proposed spending on its Information Superhighway amid concerns about costs, competition and regulations... The company's revamped strategy calls for it to substitute old fashion roof top antennae for cable in some areas."

According to an article in "New Media Strategist" titled "Interactive switched networks dumped in favor of plain digital", the current Info Highway rollout is now just another analog cable supplier. 11/16/95. (52)

> "Over the last few months the long awaited results from a host of interactive-digital trials have started trickling in. What these trials have in common is that their video services are neither digital nor interactive... The move is away from complex interactive service toward simpler, cable-like networks." [emphasis added]

"Interactive Week", another publication that has been tracking the Info Highway progress ran a summary in August, 96. (8/26/96). (53) Exhibit five shows that only one digital test line and a host of cable rollouts, with a total of only 32,000 at best. Notice that Pacific Telesis's clients were non-paying, while Bell South's service number is only 'passed homes', i.e., a wire passes the home and the person could subscribe if they cared to.

EXHIBIT 5

Rollout of Telephone Companies and Interactive TV, 9/96

	Full- motion	Hybrid/Cable	
Ameritech	0	0	20 cable franchises, 8-90 basic channels with PPV, Int. Programming guide
Bell Atlantic	0	1,000	Virginia: Video-on-Demand trial
		7,000	NJ Basic cable and Texted based.
Bell South	0	8,000	passed with cable Near-video-on-Demand, and online access
NYNEX	0	0	No announced activities
Pacific Telesis	1	1,300	Non-paying customers with basic cable one digital line
SBC	0	1,800	test with paying customers for cable
US West		12,800	Basic cable and Pay-Per View—dropped digital trials.
TOTAL	**1**	**31,900**	*Source: Interactive Week, NNI 1996*

Meanwhile the New York Time's article 12/18/95, by Mark Landler summed up the 1996 reality of the Info Highway in an article titled "Dwindling Expectations; Two Providers Reduced Expectations on Interactive TV" which discussed Bell Atlantic and Time Warner's recent announcements about their Interactive TV services. (54)

> "Within a year Bell Atlantic plans to offer 385 channels to 38,000 residents of Dover township—compared to its full-motion announcements in 1993, which predicted 3.6 million households by 1996. "

In fact, there is approximately a 300,000% difference between the amount of rollout promised and the actual lines delivered, and a 20 million percent difference in the number of fully digital lines.

Chapter 3 The Doomed I'Way — Consumers Never Cared and It Cost Too Much Money

After watching the Info Highway events unfold and then fall apart, we can look back at our research report which predicted the I-Way's demise, "Information SuperHighway: Get A Grip", (published in 1994) and say "we told you so". However, it was only later, in 1996, after everything had died down and the Internet had taken hold of the title "the new kid on the block", did we suddenly realize that it all might have been one of the most elaborate scams in telecom history. And that was something even this jaded telecom analyst didn't predict.

We now contend that there are four major reasons why the Info Highway was never built by the Baby Bells.. The first two reasons are easy to prove:

- Consumers never really cared.
- The technology didn't work and it was way too expensive.

The next two reasons are also compelling, but the trail to prove them is much more difficult.

- It was a ruse to build cable networks.
- It was never going to be built. It was a ruse to remove regulation and raise prices.

Before entering the realm of conjecture, let's first focus on some facts about consumer interest and those surrounding Info Bahn technology. We present our consumer research from the time when the Info Highway plans were still "a sure thing", 1993 and 1994. Then we'll cross-reference our findings with other market research firms' conclusions, followed by a cost and technology analysis of the I-Way. It clearly shows that it could never be built for the money the Bells had stated. Not even close.

Consumer Interest in Interactive Phone and Cable Services

During 1993 and 1994 we launched two consecutive nationwide surveys, representing 2,000 consumers (55) And the research revealed a startling finding:

> The primary reason the Information Superhighway would fail in the 1990's was that the consumers, those who actually were expected to use these new interactive services and technology, were never really interested.

And we weren't alone in discovering that consumers were luke warm, at best, to Interactive Services. A study by Advertising Age came to the same conclusion. (56)

> "A disappointing 66% of the total, and more than 70% of people over age 45, said they were **not interested at all** in new media services." Advertising Age Survey, October 1993

Using the primary applications we laid out in our previous "Wonderland" model, such as movies-on-demand, let's look more closely at the consumers' attitudes toward the new technology as revealed in our proprietary studies, circa 1993-1995 We will also cross-reference other research from Advertising Age, and a Times/CBS poll, to Fairfield Research, Inc. and Link Resources.

NNI Consumer Research — Where's the Beef?

Let's start with the first two questions about interest in videophone and movies-on-demand. (57)

- On a scale of 1 to 10, where 10 is extremely interested, how interested would you be in having a videophone service (where you can see the person you are talking to) from your telephone company?

- On a scale of 1 to 10, where 10 is extremely interested, how interested would you be in having movies sent over telephone lines to your television from the telephone company?

NOTE: NNI selected the telephone company as the primary distributor of the services because in preliminary surveys, we discovered that consumers felt more proactive toward their telephone company than to their cable company.

As the exhibit below demonstrates, it would not be disingenuous to ask at this point, "Where's the Beef?" Only 16% to 20% of the population were very excited by the prospects of these services, while 44% and 41% were not at all interested in either videophone or movies-on-demand, respectively.

EXHIBIT 6

Consumer Interest in Interactive Services, 1993

	Videophone	Movies-on-Demand
Extremely interested	16%	20%
Not at all interested	44%	41%

Source: New Networks Institute, 1993

More importantly, there is a dramatic difference in the acceptance of these new technologies by age groups, with the younger and older groups representing extreme positions. Clearly, the older the respondent, the less they want new technologies, to the point that 70% of the 65+ age group was not interested in these new services. Other criteria, such as income or the geographic location of the respondent, showed only marginal differences.

EXHIBIT 7

Interest vs. No Interest in Interactive TV Services, By Age, 1993

	Avg	18-24	25-34	35-44	45-54	55-64	65+
Extremely interested	**17%**	29%	22%	21%	15%	10%	4%
Not interested	**42%**	18%	29%	34%	44%	54%	70%

Source: New Networks Institute, 1993

While these statistics clearly reveal that the consumer was lukewarm to new technological services, the findings become much more startling when you ask if they would rather pay higher prices for the development of new technology or just get cheaper prices.

EXHIBIT 8

Higher Prices for New Technology?

	Avg	18-24	25-34	35-44	45-54	55-64	65+
Pay for new tech	**19%**	39%	18%	23%	17%	10%	6%
Want cheaper prices	**71%**	49%	73%	63%	76%	80%	85%
Don't know	**10%**	12%	9%	14%	7%	10%	9%

Source: New Networks Institute, 1993

In fact, only 19% of the population actually is willing to pay for new technology, while the overwhelming majority, 71%, want cheaper prices. As seen from the age breakouts, even the majority of 18 to 24 year olds would rather have cheaper services, while 85% of seniors (65+), want cheaper prices and do not want to pay for new technology.

More to the point, according to Fairfield Research, Inc.'s extensive historical tracking of purchases from computers and video games to ordering pay per view, only 65% of consumers who rate their interest level as "extremely interested", i.e., a 10 on a 10-point scale, would actually purchase a service.

Therefore, in 1993-1995, our belief was that only 11% of households would actually take the option to purchase new videophone services or movies-on-demand services. The overwhelming majority would not care, but would still be required to pay for development of these services.

It is interesting to note that at the end of 1996, we found only 10% of households were online. Also, the online demographics show that the majority of users are younger than the general population, as well as more affluent.

Other Consumer Research on Interactive Services

Advertising Age's Interactive TV Consumer Research

In October, 1993, Advertising Age conducted its own survey of 1,000 consumers and concluded: "A disappointing 66% of the total said they were not interested at all in new interactive services." (58)

Advertising Age however, believes that it was an educational problem and that consumers simply didn't know about the service. "So far, consumers don't have a clue what interactive media services are."

According to Advertising Age: (59)

> "What the study shows is the purveyors of interactive media service will have to heavily educate the consumer before the concept is embraced by any age group... The study also found that when asked which services they would be interested in getting (but not necessarily paying for it) 55% chose on-demand movies or TV programs, with home shopping getting only 22%."

EXHIBIT 9
Advertising Age's Consumer Study of Interactive Media, 1993

On-demand movies or TV programs	55%
Educational children's shows	48%
Travel reservations/information	40%
TV game shows	33%
Electronic mail	27%
On-line service, like Prodigy, on TV set	25%
Home shopping	22%

However, it also turns out that about 50% were not willing to pay for either new technology or monthly fees.

EXHIBIT 10

Willingness to Pay for Interactive Services

52%	Not willing to pay anything for new hardware
48%	Not willing to pay anything for monthly fees

The similarities to our study are straightforward. We found that 44% don't care at all, while the Advertising Age study found that 50% would not pay for anything.

The CBS/New York Times Consumer Poll

Some other polls conducted at the time were more optimistic. A CBS/New York Times poll conducted June 1993 with 1,347 respondents titled, "Americans want more from TV." found that 38% would be very interested in watching reruns, 35% in making videophone calls, and 22% in playing along with a game show. (60)

However, the Times also found that, on the average, a household would spend a maximum of about $10 a month more for these services, with only 26% stating they would pay more than $15 a month. Below is an exhibit of the percentage of the maximum amount that people were will to pay a month.

EXHIBIT 11

Maximum Willingness to Pay a Month

Nothing	4%
Less than $5	20%
$5 to $10	23%
$10 to $15	19%
$15 to $25	18%
More than $25	8%

Source: CBS/New York Times Poll, 1993

Unfortunately, if the average payment was really only $10 a month, then the phone companies would have lost billions of dollars on these new services. For example, at $120 a year, it would take approximately 10-30 years to pay for the new box on top of the TV.

To summarize, the overall findings from these studies and others too numerous to mention, was that there never was any interest, especially if the customer actually had to pay for the service. Also, the customer only wanted cheaper prices today, not the Info Bahn tomorrow.

There was another model that needs to be considered before we talk about the technology. Would customers migrate to these new systems, from other businesses? Ray Smith, of Bell Atlantic, claimed that customers of home video and home shopping would simply move over — "They won't have to spend a single dollar more than they had to before." In fact: (61)

> "Bell Atlantic will have the first virtual VCR, and 100,000 people by the end of the year buying things over transactional services. We will never get into the car and jump down to the store once we get used to the idea of any kind of network offering."

Unfortunately, none of the research about "Pay-Per-View", which is the Precursor to Movies-on-Demand, bear out this statement.

"Pay-Per-View": The Precursor to Movies-on-Demand.

According to a number of sources, Pay-Per-View, the precursor to (movies on demand), has never been an exciting service, and consumer research and statistics of transactions to back this statement are plentiful. Though there has been successful events, especially boxing matches and other similar sports events, or adult entertainment, Pay-Per-view has never lived up to what people projected it would attain.

First some definitions:

Pay-Per-View (PPV): A cable viewer can select a specific movie, usually running on its

own cable channel, and airing at specific times. For example, the customer can see the Jim Carrey movie, "Liar, Liar", starting at 8:00, 12:00 and 4:00 on Channel 61. Some cable systems require a specific telephone call to activate the programming, while others can be done from the TV-cable box.

Movies-on-Demand (MOD): Sometimes called "Video-On-Demand". The customer can choose a movie, past TV programming, educational specials, etc., at their discretion, any time, and have all the control features of a normal television VCR, such as "fast forward" or "pause".

Near-Video-On-Demand (NMOD): A system that has some, but not all of the features of Movies-on-Demand. For example, in one RBOC test, humans loaded specific movies for customers. In another test, once a selection was made, there were no controls, such as pause.

Though many argue that comparing pay-per-view to movies-on-demand, is wrong because MOD is interactive — movies on a rotating schedule vs movies when you want them. However, MOD tests around the country demonstrated that a person's free time is limited and therefore viewing time, regardless of the technology, whether it be a VCR rental, a Pay-Per-View or even Movie-On-Demand, are all vying for the customer's time, which makes them comparable. Just the delivery vehicle is different.

VCR Penetration and Video Rental Market

Let's start with video rentals. The exhibit below reveals that in 1993, the majority of American households, 85%, had VCRs and that these households rented approximately 7 tapes a month (1.6 tapes a week, about 83 movies a year) in 1993 — which brought in about $13.5 billion dollars. (62)

EXHIBIT 12
Fairfield Research on VCR Penetration and Usage, 1993

Number of households with VCRs	85%
Average rental cost	$2.60 per rental
Average per month	7 movies a month

To update to 1996, an article in the Wall Street Journal "Video Buying Is Surprise Hit With Viewers" (63) 1/17/97, quotes Adams Media Research, who found that video rentals and purchases in 1996 came to a total of $16.5 billion. Also, an entirely new phenomena has been occurring in the video stores — customers are now purchasing videos as well as renting them. In fact, according to Adams Media research, Disney's video sales alone hit $2.6 billion during 1996.

While this $16.5 billion dollar industry is thriving, historically, pay-per view has been, comparatively, almost dead in the water.

Consumer Pay-Per-View Statistics

Link Resources Annual Consumer study from 1993, based on surveying over 1,400 consumers, showed that there just wasn't any interest in pay-per-view services. Only 7% of households said they were very interested, while the overwhelming majority, **72%, stated they were not interested in pay-per-view,** even if it was "possible to order pay-per-view programs like boxing matches, hit movies, or concerts to watch over cable TV, not prerecorded cassettes, and pay for them on a per-program basis." (64)

EXHIBIT 13
Link Resources Survey of Interest in Pay Per View, 1993

Very interested	7%
Interested	20%
Not interested	72%

Source: Link Resources, 1993

But that is not the bad part of the story. Link's examination of households that DO order pay-per-view revealed that 50% of households ordered less than once a month, 21% ordered about once a month, and 21% ordered two or three times a month. Heavy users, customers that used Pay-Per-View at least once a week, were less than 2% of the users, equating to approximately .4% of the population.

EXHIBIT 14
Frequency of Ordering Pay Per View, 1992

Less than once a month	50%
About once a month	22%
2-3 times a month	21%
4 or more times a month	2%
Don't know	5%

Source: Link Resources, 1993

In another research study, Paul Kagan Associates estimated that approximately $361 million was spent on pay-per-view in 1993, and that the average price was $4.35, which comes out to less than **one pay-per-view order per household per year.** (65)

If the findings about the lack of public interest isn't enough, a more disturbing consideration is just how profitable the area was expected to be.

Bob Alexander, president of Alexander & Associates, discussed the cost structure of the pay-per-view markets and stated that the RBOC video-on-demand services had to generate billions, while in 1993, pay-per-view was lucky to break even. In a New York Times article, 2/17/93 he states: (66)

> "Everyone is talking about video-on-demand as the "killer application" for interactive television. But I don't think it stands up."

According to the New York Times:

> "Mr. Alexander estimated that it would cost $100 billion to deploy advanced electronic network to most American homes [to offer the service]. That works out to almost $1,000 a home. He then assumed that the price per movie in the interactive television trials would be $1 to $4, generating an hourly rate of 50¢ to $2 per hour, of which the cable operator would clear 25¢ to $1.
>
> "Then he estimated that the cable industry would require a 15% to 20% return on investment. If that is true, it would require 20 to 80 billion hours

> of movies-on-demand. If the figure were 50 billion hours, that would work out to 500 hours per household—10 hours per week, or 5 movies a week for every household in the country. It is not disloyal to say that this kind of activity is simply not in the cards. Something besides movies-on-demand will have to pay for the new networks."

Shifting back to the current state of affairs, Video Magazine, in an article titled "Video-On-Demand Tests, and Hype Continue Despite Telco Shift to Wireless Communications", 4/14/97, (67) the phone company roll-outs are all but stillborn.

> "Despite the lofty predictions and continued tests, the major phone giants are still displaying little eagerness to jump into the video business."
>
> .

The article also found that while Bell Atlantic stated that most customers in their northern Virginia 18 month, 1,000 household test of near-video-on-demand "quit renting videos", this was still only a test and deployment is years away, if ever. Notice that it is "near-video-on-demand", not the real thing. And it is 1,000 people instead of 100,000. (68).

> Bell Atlantic doesn't plan to roll out 'true' video-on-demand service until 1998 at the earliest, and then only in Philadelphia." (69)

Using the Alexander statistics, the company would have to dramatically increase usage, not simply have customers "quit renting videos." Also, there was no mention of whether Bell Atlantic charged customers for movies they viewed in the test.

Meanwhile, Video Magazine, (70) stated that Pay-per-view services only garnered $500 million dollars in 1996. Not a great deal more than in 1993.

Technology Doesn't Work And It Is Too Expensive: Original Cost Models.

During the 1990's, numerous sources provided information about the costs of outfitting the network and the consumer with the proper Info Bahn technologies. While the phone companies insisted that the average cost per household was $750-$1,000, our

finding was that it would cost over $2,500 per customer. And that was just for the required new TV/cable set-top box in the house.

In fact, both numbers were way low. The technology never worked as advertised. As previously mentioned, US West stated that the technology to create interactive television was "years away and more expensive than originally thought".

Meanwhile, an article in the New York Times, 12/18/95, quoted Bell Atlantic, which stated that the price to deliver the "Wonderland" applications was about 17 times the original costs. (71)

> **"Bell Atlantic revealed that it cost $17,000 per household to build and deliver a Full-Service network."**

The Info Bahn Technology Made Simple

Simply put, there are a series of costs associated with delivering full-motion video to the home. (We will discuss networks and services, including ISDN in future sections) These include: (72)

- **Rewiring the Street:** The entire street wiring, either on the poles or below the ground, as well as all of the "drop-lines, lines that connect a house to the street's main wiring, must be redone.

- **All New Network Components, Including "Switches":** Fiber-optic cable requires all different network switches, which are advanced computers connected to the fiber-optic lines that control and distribute the massive amounts of video and audio over the network.

- **A New TV Set-Top Box:** Like the cable set-top box that usually sits on top of the TV or VCR, the Info Highway design requires a new, very powerful computer, today costing thousands of dollars per home.

- **Rewiring the Entire House:** A house has to be entirely re-wired with fiber-optic cable, replacing the copper wire.

- **Besides all of these charges there are hundreds of other detailed charges that are not important for this discussion.**

The rest of this section looks at the costs for the I-Way as presented over the last five years.

Other Info Bahn Technology Models: Bear Stearns

Bear Stearns released a report in 1994 titled "New Age Media," which estimated technology charges would range from $650—$1,100, using information supplied by Bell Atlantic and other companies. There are two models: the telephone Broadband system (BBT FLX) should cost $650-$900 per household, while a hybrid cable version (TVHFC) would cost $950-$1,100. (73)

> "For offering interactive applications, systems such as those being installed by Bell Atlantic and using technology from broadband technologies are less expensive than the cable TV hybrid fiber-coax (TVHFC) network solution. Total costs for installing the BBT FLX System (Broadband) would range from $650 to $900 per home, while the typical cable TV HFC system should range between $950 and $1,100."

Technological issues aside, their price for the various components gave the expense of the set-top box at only $225 for a "telephone digital video terminal" to $450 per home for a "cable TV hybrid fiber-coax set top." Other expenses were outlined, such as the "Telephone Optical Network Unit" at $60 to $180, or the telephone's "Host Terminal" at $200 per-home passed, excluding inside wiring costs.

A Few Techno-Naysayers

There were some who didn't believe the hype. For example, numerous speeches given at a conference titled "Interactive Marketing," May 1994, (74) discussed the technological and manufacturing hurdles required to bring to the residential subscriber full-motion, interactive video services. The consensus was simple:

- The boxes required computer chips that were not yet being mass manufactured.
- The initial boxes would cost $2,000–$5,000 per unit, since they are, in reality, high-speed computers and not production models.
- The mass market manufacturing price would most likely wholesale for $1,200–$1,500 per unit.

In fact, in most of the Interactive TV trials during 1994-1995, the price per set-top box was between $4,000-$5,000. The Time Warner trials in Orlando, originally scheduled for spring 1994 (and shut down in 1997) were delayed a year because even the prototypes were not fully operational and the boxes reportedly cost $5,000. In another trial by Viacom and AT&T in Castro Valley, that was also canceled, the cost was $4,000 per box.

While the hope was to have the mass production unit cost only $300 per set-top, based on computer pricing and increases of computing power, it will most likely be 2005 before this threshold is reached, possibly longer.

This $4000-$5000 box didn't take into account the network upgrades, or the digital switches and servers, which were believed to cost an additional $1,000 to $1,200 per subscriber.

Last, but not least, is the required last mile of rewiring from the street to the customers' premises and through the house. In 1996, the nationwide average for an installation was about $82.58 (75) for the first hour and $63.15 for each additional hour. Rewiring would take, on the average, 1.5 hours or $115, not counting initiating service fees, deposits, etc., which can be an additional $250. This also would not include "drop-lines," and a host of other specific installation services.

Adding up all these variables, in 1995, we expected the average new customer to cost at least $2,500, after a production model was finally deliverable.

Cable and Phone Company Techno-Wiring Hodgepodge

Some plans called for the cable companies to use their existing wiring, or the phone company to use the copper more effectively. But like a Rube Goldberg

contraption, where every turn is turmoil, there is an entire mismatch when using the existing wires—especially for the final mile and the customers' residence. For example, just look at the household placement of telephone and television/cable. The most obvious problem is that the wiring is not in the same room. The phone is almost always in the kitchen or bedroom, while the TV is in the living room, den, or bedroom (not necessarily the same bedroom as the telephone).

Rewiring, either for cable companies offering telephone or visa versa would also require rewiring homes. Would the RBOCs waive the installation charges? Would people pay them?

The 1996 Punchline: Average cost per household was $17,000

Chapter 4 Case Study: Opportunity New Jersey—An I-Way Failure

Opportunity New Jersey, the first of the Opportunity alternate regulation plans, turned out to be nothing more than an opportunity for Bell Atlantic to make more money. Using this as a case study, we would like to demonstrate how the broken regulatory fabric and the massive Bell lobbying efforts, specifically Bell Atlantic, all worked in conjunction to overcharge customers without serious retribution from the state commission, the Advocate's office, or even the state legislature.

Though we will return to all of these topics in future chapters, what happened in New Jersey pretty much sums up the process of regulation nationwide — a failure of the regulators to control Bell profits or monitor Bell's technology deployment promises.

What Happened to the Info Bahn in New Jersey?

According to a brief filed by the New Jersey's consumer advocate (Division of the Ratepayer Advocate) with the New Jersey Board of Regulatory Commissioners (BRC), NJ's state utility commission, on March 21, 1997: (76)

> "Bell Atlantic-New Jersey (BA-NJ) has over-earned, underspent and inequitably deployed advanced telecommunications technology to business customers, while largely neglecting schools and libraries, low-income and residential ratepayers and consumers in Urban Enterprise Zones as well as urban and rural areas."

So much for the promise of the Info Bahn. Before delving into the telecom muck and how the Bell has prospered by not fulfilling promises and thus overcharging customers, let's go back to 1991, when New Jersey Bell presented a new plan created by Deloitte & Touche to move New Jersey into the future.

Background

In March of 1991, the findings of a report written by Deloitte & Touche on behalf of New Jersey Bell were presented to politicians and government regulators, from the

Governor on down. Dubbed "Opportunity New Jersey", it stated that New Jersey needed to implement "policies that encourage development of an advanced telecommunication infrastructure." In fact, the study stated, this was essential for New Jersey's future. (77)

> "(fiber optics is) essential for New Jersey to achieve the level of employment and job creation in that state", would "advance the public agenda for excellence in education", and "improve quality of care and cost reduction in the healthcare industry".

And this rhetoric was also repeated by the phone company. For example, Alfred C. Koepee, Vice President of New Jersey Bell, said the plan was New Jersey's future, building new networks to create jobs. (78)

> "You have a choice as a regulator. You can move into the future, or you can put through a 10-cent reduction in somebody's bill. It makes a lot of sense to build the new technology to create new jobs."

According to an article by Rick Linsk titled "All the Right Connections, — New Jersey Bell and the Wiring of a Regulatory Bonanza", from The New Jersey Reporter, the entire series of events that led up to the passage of Opportunity New Jersey by the state legislature and endorsed by the state utility commission, was one of the most masterful lobbying jobs in the state's history. According to Rick Linsk:

> "Above all, though, credit goes to a combination of muscle and merit and to one of the savviest, most complete and aggressive lobbying efforts ever to accompany a public issue in New Jersey. For nearly a year, Bell missionaries had swarmed over the state spreading the gospel of fiber-optics to doctors, teachers, labor leaders, the (Governor) Florio Administration and the Legislature. It is now clear, in retrospect, that the hard-sell worked so well, and the connections forged by top-flight influence-peddling ran so deep, that Bell had won long before the first vote was cast.

> "When the dust had settled, the Bell had spent $640,000 on lobbying, a huge sum by New Jersey standards. For comparisons sake, Bell spent $79,079 the year before." (Note: This figure does not include the Deloitte & Touche study.)

Others, such as Nancy Becker of the New Jersey Cable Association, believed that even the Deloitte & Touche study, at a cost of $1.2 million dollars, was nothing more than a lobbying document. (80)

> "It was basically a lobbying document with the imprimatur of the board (Utility board) on it... It was a million-dollar lobbying document. "

According to Linsk, other critics made it clear that the Board of Regulatory Commissioners, (BRC), specifically Edward Salmon, Chairman, was perceived as "too tight" with the Bell company. (81)

> "Arthur Cooper, president of a pay-phone company that competes with the Bell: This is my opinion, but if everybody in the room was blindfolded, and without being introduced he (Salmon) read his testimony, they would have thought he was not from the BRC; they would've thought he was from Bell."

In May of 1993, the New Jersey Commission officially implemented Opportunity New Jersey.

The Outcome — Opportunity for the Bell

According to the NJ Advocate, the original rate-of-return regulation was replaced by Opportunity New Jersey, an alternate regulation plan based primarily on the promise of "greatly accelerated deployment of advanced technologies...approximately $1.5 billion dollars above current expenditures." (82)

> "The ONJ (Opportunity New Jersey) Plan replaced traditional rate-base/rate of return regulation with an incentive ratemaking system in

> exchange for a commitment from BA-NJ to greatly accelerate deployment of advanced technologies in its communications network to the entire State by the year 2010 at an estimated additional capital expenditure of approximately $1.5 billion above "business as usual" from 1992 through 1999. Through the incentive of alternative regulation under the ONJ Plan, BA-NJ was given the financial flexibility to operate in the new competitive telecommunications market in exchange for commitments to upgrade the network in order to realize "positive benefits" to the New Jersey economy."

In fact, according to the Advocate, the Bell company only spent $79 million dollars, not the $1.5 billion promised. (83)

> "Although BA-NJ projected that it would expend approximately $1.5 billion in network investment above "business as usual" by the end of 1999...However, the Ratepayer Advocate has calculated that BA-NJ has spent a total of $79 million above "business as usual" over these years."(1992-1995)

More to the point, the actual dollars spent on construction dropped below normal levels. (84)

> "BA-NJ can hardly be characterized as having made capital expenditures beyond "business as usual" during the first three years of ONJ. (1992-1995) Indeed, in constant 1987 dollars, the company's capital expenditures have actually decreased. "

And how has Bell Atlantic prospered from the plan? — Almost one billion dollars of excess profits, and a return on equity almost twice what a regulated monopoly should be making. (85)

> "Since the time of the adoption of the ONJ Plan, BA-NJ has received enormous financial benefits, greatly in excess of the Company's original projections. The gains captured by BA-NJ, which probably would not

have been achievable but for the Plan, as set forth immediately below, involve earnings, dividends, return on equity, cost of debt and additional benefits."

During this period:

- "BA-NJ paid out an additional $954.8 million in dividends* over what was projected in 1992" (1992-1995)
- "the Company is earning a return on equity in excess of 21%, well above the average New Jersey State utility rate of return (11.25%) and substantially higher than any rate of return authorized by the Board in recent memory."
- "net earnings have increased by $85 million, its cost of debt has declined substantially resulting in an annual savings of $22 million in interest expense."

NOTE: *Dividends, in this case, are the monies that New Jersey Bell paid to Bell Atlantic, the holding company.

The Other Dark Secrets to Opportunity New Jersey

Besides the obvious overcharging of customers, the Advocate in two other documents, one discussing the Bell Atlantic/NYNEX merger, and the second being the Advocate's annual report, (86) clearly showed that Bell Atlantic/New Jersey business practices were filled with problems. They ranged from the company's customer service provisioning, or the price of ISDN service, to low-telephone subscribership due to non-existent low income options.

- **Customer Service Provisioning**: According to the Advocate, numerous customer services, from meeting appointments to even properly answering directory assistance calls, have all had a decrease in the standard measurements of good service. (87)

"BA-NJ's performance in the following categories was lower in the year ending September 1996 than in 1993, 1994 and 1995:

(1) percentage of service order provisioning completed within 5 working days;
(2) percentage of service order provisioning appointments met; and
(3) percentage of directory assistance calls answered within 10 seconds."

"In addition, the service standards regarding the percentage of BA-NJ customers having no difficulty reaching repair were below the targeted levels in July and September 1996. These standards also dropped from 1995 to the year ending 1996 by approximately 450 to 500 basis points. In addition, the service standard regarding the percentage of service trouble reports cleared within 48 hours experienced a percentage decrease of approximately 480 basis points from 1995 to the year ending September 1996 and this service standard was below the exception and surveillance levels in July 1996 and August 1996. "

• **Lack of Low-Income Options**: New Jersey has had a steady decline in the number of telephone subscribing households, and the Advocate believes that this can be attributed, in part, to the fact that the state had not implemented proper low income options. (88)

"The Ratepayer Advocate has continually pointed to the fact that BA-NJ fails to provide adequate measures to ensure the availability of affordable telephone service for the state's low income consumers.

"In 1995, New Jersey was identified as the only state that experienced a statistically significant decrease in residential penetration, and in 1996, New Jersey was only one of three states (plus the District of Columbia) to have experienced a decrease in subscribership.

"Although New Jersey's annual average penetration rate rose slightly from 92.3% in 1995 to 93.6% in 1996, the fact still remains that New Jersey has experienced a declining subscribership for the past several

> years, and that, despite the increase reflected in the most recent monitoring report, we continue to fall below the national average."

• **ISDN Rates:** According to the Advocate, BA-NJ's ISDN rates are "excessive" and this is stifling deployment of ISDN. (89)

> "The Advocate argues that Bell's proposed residential ISDN rates are excessive and will stifle deployment and expansion of this valuable technology...Bell's proposed revised tariff submitted to the Board on April 19, 1996, offers residential ISDN service in New Jersey for prices ranging from $23.50 to $249 per month, with full bandwidth usage charges of $0.04/minute from 7 a.m. to 7 p.m. and $0.02/minute from 7 p.m. to 7 a.m. Over the ensuing four months, the Ratepayer Advocate and Bell attempted to negotiate a settlement to set mutually acceptable rates, but Bell did not propose an ISDN pricing structure which the Ratepayer Advocate could support. "

"Fatally Flawed" New Research —Another Deloitte & Touche Study

The Advocate also discussed a new survey prepared for Bell Atlantic by Deloitte & Touche, stating that it was "fatally flawed". The survey attempted to "demonstrate the importance of telecommunications to business in terms of their operations, efficiency and competitiveness and how their usage of advanced technologies has dramatically increased.". (90)

> "Deloitte & Touche Consulting Group conducted a survey of 45 businesses in the State of New Jersey. The survey indicated that 97% of the businesses surveyed believe that telecommunications is critical to their business' ability to compete. The survey also showed that business usage of telecommunications increased by 80% over the last three years. Among all the businesses surveyed, 75% used ISDN, 60% used frame relay, 41% had dedicated lines, and 30% used SONET rings. The survey of small business showed that 100% used ISDN, 75%, used frame relay service, 41% had dedicated lines, and 30% used SONET rings." (91)

Reviewing the methodology and findings clearly shows just how flawed this self-serving study is. First, probably only 2-5% of business users use ISDN services today, not 75%-100%. Worse, Bell Atlantic created the list to be surveyed, knowing full well these were heavy users of new technologies. According to the Advocate: (92)

> "The study presented to the Board cannot be relied upon because it is fatally flawed. The study is of only 45 businesses in the State, which is not a representative sample of the businesses in the this State. Furthermore, the 45 business selected by Deloitte & Touche were drawn from a list supplied by BA-NJ, which was comprised of BA-NJ customers."

Advocate Solutions — A slap on the wrist would have been nice.

While the Advocate has tried to help subscribers, a recent agreement between the phone company and the regulators pertaining to Opportunity New Jersey clearly demonstrates just how broken the regulatory system is.

As just outlined, the Advocate found that Bell Atlantic had not delivered on the Opportunity New Jersey Plan. There was no interactive services nor any massive fiber-optic deployment. More to the point, almost $1 billion dollars of excess dividend profits was accrued by the Bell company from 1992-1995.

Yet the agreement made between the Bell company and the state clearly shows that the regulators are either unwilling or unable to step up to the plate. Here's the details.

A press release from the New Jersey Advocate titled "New Jersey Consumer to See $176 Million in Benefits from Bell Atlantic Agreement with Ratepayer Advocate and BPU" was released on April 21, 1997. (93) And though the rhetoric says that schools will be wired and low income residents can receive discounted rates for phone service...

> "As a result of the modification of ONJ, Bell Atlantic will accelerate its schedule to provide New Jersey's 3,557 public and not-for-profit schools and public libraries with broadband service by the end of 2001, offer up to 225,000 low-income residents a discounted rate for phone service, accelerate its schedule to provide Urban Enterprise Zones with access to

high-speed telecommunications services, and create up to 800 new jobs in New Jersey by the end of 1997."

...the details reveal that the rewards are mostly handwaving. There are virtually no quarantees of any monies returning to subscribers. The release states: (94)

- "establish a "Lifeline" fund for eligible low-income New Jersey residents, which will provide a **credit of up to** $7.00 per month/customer, with an estimated total value of $18 million";

- "forego seeking rate increases through 1999 that **could have totaled** $28 million; and",

- "use **best faith efforts to** achieve a net job gain of 800 full-time employees in New Jersey by the end of 1997."

What's wrong with this picture? All of the savings and new service promises are based on 'conditional' phrases: "use its best efforts to get jobs", "offer a credit up to", and forgo rate increases that "could have totaled $28 million". There is not one concrete dollar. From a legal standpoint, if the company spends only $2 dollars it qualifies as an "up to" amount.

Meanwhile, customers are paying hard money, by having to pay excessive prices, and therefore Bell profits, while all that's been agreed upon is soft money — there is no cash, no refunds, and even no legal promises.

More to the point, in 1997, New Jersey Bell still charged for Touchtone Service, and its Toll call prices were still some of the highest in the country. Also, the company's returns were 100% higher than a utility should be earning.

And then there's the amount of excess — almost $1 billion dollars of excess profits. This means that customers paid over $300+ million a year in excess dividends, and yet this agreement calls for nothing more than a 'value of $176 million in benefits" with no payback for over $1 billion dollars and no reductions of $300 million annually!.

To put this into perspective: New Jersey had approximately 5.4 million phonelines at the end of 1995, so the overcharging comes to approximately $175 per line (counting interest) for just those three years.

The author's position is that the Bell company should have been re-regulated, all of the monies accrued that were not spent on the fiber-optic service provision should have been returned, penalties should have been imposed, including interest, and prices should have been slashed to the appropriate level of a company who's regulated rate-of-return should be 11%; i.e., a utility rate , not the current 21%+.

In this case we fault, not the Advocate, though they may have been able to get more concessions from the Bells, but the New Jersey Board of Regulatory Commissioners for not adequately protecting the public interests.

Oh-Oh, Another Billion Owed? What About Massive Network Write-offs?

The Advocate found that Bell Atlantic-NJ dividends were excessive and that the return on equity had doubled, but there was another billion dollars of extra profits that they didn't include. It was accrued from a massive network write-off, based on a change in accounting, a change that was implemented because of Opportunity New Jersey.

In Chapter 18 we detail "depreciation", a business accounting term that describes how a company writes-off its construction expenses, and we explain that by accelerating the write-offs the Bell companies were garnering billions in basically free cash. This cash was supposed to be used specifically to build the fiber-optic highway, but virtually nothing was ever built.

More to the point of our story, in examining the 1994 Bell Atlantic-New Jersey Annual Report, we find that with the implementation of Opportunity New Jersey, the telephone company changed its accounting principles and took additional write-offs, adding over $1 billion in free money. This accounting's obscure name is "FAS 71", for Financial Accounting Standard 71. (95)

EXHIBIT 15

Bell Atlantic New Jersey, Write Bonanza, 1994

(in the millions)

Increase in Plant and equipment depreciation reserve	$ 946
Other regulatory assets and liability elimination	$ 67
Total	$1,013

Source: New Jersey -Bell Atlantic Annual Report 1994

This billion dollars was applied to income tax and so the company showed the charges, as a savings of $423 million in taxes and a charge of $589.7 million in extra cash. (96)

> "In connection with the decision to discontinue regulatory accounting principles under Statement No. 71, the Company recorded a noncash, after-tax extraordinary charge of $589.7 million, which is net of an income tax benefit of $423.2 million." [emphasis added]

There were also a host of other savings not mentioned by the Advocate, from a $7 million "extinguishment of debt", and a $67 million dollar "Regulatory Asset and Liability elimination", to a $36 million dollar annual increase in depreciation expenses.

And make no doubt about it. These savings were accrued because of Opportunity New Jersey. (97)

> "The Company's determination that it was no longer eligible for continued application of the accounting required by Statement No. 71. It was based on the belief that the convergence of competition, technological change (including the Company's technology deployment plans), actual and potential regulatory, legislative and judicial actions, and other factors are creating fully open and competitive markets." [emphasis added]

When we consider that Bell Atlantic never built the highway, nor was there competition in 1994, can these accounting changes be justified, or are these additional monies that should be returned to subscribers? We will return to this question in later sections.

Chapter 5 ISDN (The Info Bahn, Take 1): "It Still Does Nothing"

Non-Technical Definition: ISDN, Integrated Service Digital Networks, is a digital access line, that should give the customer more information, faster, over a single copper telephone line. An ISDN line should deliver 3-5 times more speed for Internet connections, or deliver larger graphics files faster. The service can also be used as two separate telephone 'channels' over one wire, meaning that the customer may have two telephone calls simultaneously, without bringing an additional second wire into the home.

Technical Definition (See footnote 98)

The Promise:

ISDN was the original promised technology for the first Information Superhighway, circa, the mid-1980's. In 1986, over 12 years ago, Southwestern Bell's Annual Report said ISDN would "revolutionize day-to-day communications". (99) Pacific Telesis promised that ISDN "will enable everyone with phone service to take part in the information revolution over fiber cable or the now-common single copper pair of wires."(100)

Sound familiar? Well for the next decade, ISDN has been little more than 10 years of smoke and mirrors. It is the original "Failure to deliver on promises of new network enhancements".

This lack of deployment should also trigger in the reader's mind the need for audits and investigations on a state and federal level. Why? Because state alternate regulations gave the Bells more profits to be used for ISDN technology deployment...which never occurred.

The ISDN Reality, 1997-1998

According to many in the new media industry, ISDN is still not a fully functional service. It is very expensive, it can't be easily delivered if the person lives 3 miles from a

network switch, and some areas can't receive ISDN at all, including major parts of NYC. And horror stories of people trying to use it are legendary. A recent article by Al Perlman, a web/technology writer for Interactive Week, titled "Fear and Loathing With ISDN" (October 6th, 1997), defined ISDN as "It Still Does Nothing". He summed up the various horror stories he had heard. (101)

> "The problems ran the gauntlet of bureaucratic foul-ups. inexperienced technicians, telephone personnel who never heard of ISDN, incompatibilities with ISDN lines of other carriers and on and on."

Perlman's own experience with ISDN service: It never worked as advertised and the phone company "doesn't know when this will be fixed". As he put it, even after a decade, the telephone companies still don't have the kinks worked out. (102)

> "I had heard all the horror stories but tried to defy the odds. I remember writing about ISDN for the first time in the mid-1980's. I'd had thought, by now, the telephone companies would have figured out a way to deal with this technology. But in my experience, No dice."

Ironically, almost two years ago, Kate Maddox, senior editor of now defunct Interactive Age, called it "A Consumer Nightmare." (July, 1995). (103)

> "Despite all the hoopla about advances in ISDN (just about every Regional Bell is touting it as the next frontier), I had heard horror stories about getting one hooked up and working in your home.... I wouldn't recommend ISDN for consumers unless they have plenty of time and their own private tech support team.

Ms. Maddox goes on to say that it took "a veritable army of support technicians in four states", cost over $900 dollars including hardware and telephone installation, none of the equipment worked with each other and the entire package took over three months to be almost functional. In fact, Ms. Maddox had to put in a network "repeater" because she was more than 14,000 feet from the Central office...at an expense of an additional $21.50 a month.

Jerry Michalski, industry analyst and Managing Editor of the respected Release 1.0 newsletter, said even the telecom resellers are telling their clients not to use ISDN. According to Michalski: (104)

> "Our system integrator talked us out if it. He said it wasn't dependable enough to use on a day-to-day basis. And we're located in the middle of Manhattan's Silicon Alley."

Others can't even get the service. Daniel Dern, former editor of Internet World and author of two books on the Internet (MC Graw Hill, Prentice Hall) states: (105)

> "ISDN is a joke. After a bunch of calls they told me I couldn't get it because I lived over three miles from the central office. Worse, my friend in Boston got his installed and it keeps having problems. When he calls NYNEX they tell him that they don't offer anything called ISDN."

So what if ISDN was advertised in the mid-1980s as a technological wonder that would change the world.

ISDN — The First Information Superhighway — That Never Was

Using the Bell's own words, we want to make it clear that the Bells promised ISDN deployment in the 1980's and they even stated that it was available by the early 1990's. Let's go back over 10 years. Here's some of the RBOCs on ISDN. Notice that the words "Information Superhighway" can be almost substituted without missing a beat.

Southwestern Bell, **1986** Annual Report: (106)

> "At the forefront of new technology is ISDN. Scheduled for commercial availability in 1988, ISDN will revolutionize day-to-day communications by allowing simultaneous transmission of voice, data and images over a single telephone line.

"With ISDN customers will have the potential to access videotex, telemetry, alarm services, sophisticated calling features, teleconferencing much more economically than they can today. The company is responding to requests for ISDN services by custom -fitting it's ESSX central office based communications services already in place. "

Pacific Telesis **1987** Annual Report: (107)

"Pacific Telesis's Group's vision of the future is universal access to information — Thanks to ISDN.

"In 1987 Pacific Bell began the first in a series of three tests, to be completed by 1988, of a new technology for ISDN. I'm not going to launch into a highly technical discussion of ISDN here, but I would like to point out why it's so important. Developing a universal, international standard ISDN will insure the compatibility of communications equipment which will enable everyone with phone service to take part in the information revolution over fiber cable or the now-common single copper pair of wires."

Pacific Telesis **1988** Annual Report: (108)

"To accommodate growing voice and data traffic we've nearly completed digitization of Pacific Bell's interoffice circuits. By testing and implementing advanced technologies like ISDN — which will allow customers to transmit digitized voice, text, video and graphics simultaneously over ordinary Pacific Bell lines — we're preparing California to compete in the 21st Century global economy."

Bell Atlantic's Annual Report **1990**: (109)

"Bell Atlantic's investment in new technology also includes deployment of Integrated Services Digital Network (ISDN) features. ISDN combines telephone and computer transmissions on a single line and makes creation of computer networks relatively simple and efficient. Users include major

> customers such as the John Hopkins Medical Institution in Baltimore and several federal agencies in and around Washington. Bell Atlantic has successfully tested ISDN for residential users, as well, in anticipation of the growing demand of home data services. "

Ameritech **1991** Annual Report: (110)

> "ISDN Speeds Information. 'The ISDN link multiplies, by more than 40, the speed with which information can be transmitted', says Illinois Bell's Bill Kallmyer, senior marketing operations manager. 'This results in higher productivity and lower on-line charges for consumers'. Kallmyer says ISDN is available to single-line customers as well as larger firms." [emphasis added]

And the promise of ISDN continued into the 1990's. For example, Pac Bell's "Education First" program was to spend $100 million in connecting all schools to the superhighway by 1996. (111)

> **"Pacific Bell Helps Bring Schools On-line.** As part of a continuing commitment to education in California, Pacific Bell has launched Education First, a $100 million program to connect the state's schools to the communications superhighway. By the end of 1996, all of the nearly 7,400 public K-12 schools, libraries, and community colleges in Pacific Bell territory will have access to the company's Integrated Services Digital Network (ISDN), which enables simultaneous transmission of voice, data and video signal over a simple telephone line." [Emphasis added]

According to CNN, (8/17/97) in 1997, only 60% of California schools had computers and less than half were online. (112)

To show the disparity between these Bell quotes of bravura, and the actual deployment, the next exhibit highlights a survey of the Bells by Interactive Age, July 1995, clearly showing that all of the Bells, with the exception of Pacific Telesis, never rolled out ISDN to residential customers. Meanwhile, Pacific Telesis only had 53,000 total ISDN lines installed at the end of 1995. (113)

EXHIBIT 16
Regional Bell Residential ISDN Offerings, July, '95

Ameritech	Has only a trial running for ISDN Service
Bell Atlantic	Beginning residential trial
BellSouth	Has only a trial running
NYNEX	Has only a trial running
Pacific Telesis	Goal of 1 million lines by 1998
SBC	Installing software in switches, few "Market probes"
US West-	Still installing software in switches

Source: Interactive Age, 95

More to the point, there have been two pictures that are painted about ISDN deployment: One picture is supplied by the people who are selling ISDN and related products while the other is represented by those who actually want to purchase it. This split-brain market representation has been going on for years.

Take the following example. The first quote is taken directly from the NYNEX 1993 Annual Report. Here, NYNEX is discussing their wonderful new telecommunications services. This is followed by the user perspective, highlighted by an article in The New York Times titled "The Information Future Out of Control: Hello, Anybody Home?" written by a NYNEX user, James Gleick, who helped start the online service called Pipeline.

As you will see, the reality vs. the company's myth collides when customers actually try getting the advertised technology.

NYNEX 1993 Annual Report: (114)

> "Private-line service as quick as a click: bandwidth where a business wants it, when a business wants it, as much as it wants, for as long as it wants. That's the value of NYNEX Enterprise Services, a set of new networking tools that bring unprecedented flexibility to private-line voice data and video systems"

From: The New York Times article by James Gleick (115)

> "I have visited the advanced telecommunication research laboratories and have seen what technology can bring, ISDN, which promises to turn ordinary phone lines into high-bandwidth carriers of pictures and videos. I've also visited the local telephone company and seen what technology can't bring. I've tried to order this very service. I have a 14-page, four-color brochure! "NYNEX ISDN Primary Service. For more efficient voice, data, image and video... " The Pipeline's [author's company] order has been floating about for months. Our sales representative says he wrote it up three times, and each time the system bounced it back. I have a phone number for an ISDN specialist inside NYNEX, but he doesn't seem to have voice mail. The Pipeline is not alone. The large, private on-line services, too, rely on more or less the same graying telephone technology, not ISDN. "

After the article appeared, NNI contacted five other online providers, all located in the New York City, we found that none of the five companies could get adequate ISDN services. Two out of the five companies had filed complaints with the New York PSC, while the other three were transferring all business to Metropolitan Fiber, (MFS), another NY local phone provider. (116)

The Skinny on ISDN Rollout — Waiting for the Godot, the Info Bahn, or just making more money from doing nothing.

The history of ISDN should be understood in relationship to "telecom buzz", i.e., what's hot every two years or so. In the early/mid-1980's, ISDN was the next generation of telecommunications, to be rolled out as fast as possible. And though there was a great deal of handwaving, there is little proof that the Bells ever had any intentions for mass deployment in the mid-1980's.

By 1993, ISDN was all but forgotten. The fiber-optic Information Super-Highway, that nationwide, 500 channel, full-motion video, network, was being touted as the new, bigger, better, next generation telephone network coming soon... and to a TV set too. This perceptual change was not something imagined. One has only to look at the

number of articles that disappeared as ISDN topics in 1992, only to be supplanted by Info Highway topics.

For example, a Bell Atlantic sponsored study presented by the "National Economic Research Associates", pooh-poohed ISDN rollout. It suggested that industry groups such as Electronic Frontier Foundation, (117) who were calling for ISDN deployment was "old world" thinking, while broadband, fiber-optics was "new world".

The Bell sponsored research stated (118)

> "It would be unfortunate if the public policy focus were to be on implementing only ISDN rather than on taking the necessary steps to facilitate the transition to a broadband network. While it is important to use existing technology fully during the transition, the danger of the emphasis is that policymakers may take away from it a view of the "Old New World", rather than the "New New World" of Broadband. "

By the summer of 1995 the "500 channel universe" was no longer the buzzword. The Internet had been proclaimed the new winner and ISDN, the telephone network that can make the Internet more successful, at least in the minds of the media, has once again been crowned as the next future, albeit, interim hot product.

However, massive staff cuts and lack of network upgrades caught the Bells' understaffed and unable to deliver the technology with any speed. In fact, based on interviews with Bell staffers, we now believe that staff cuts throughout the Bell system have been so severe, that the remaining staff made promises which they could not keep, either because of a lack of expertise, or simply because there weren't enough warm bodies to fulfill orders.

And the exact promises? Mass-deployment at cheap prices.

In February 1993, Ameritech's Russ Ruebensall, Marketing Operations, Data/ISDN Product made a presentation to the Ohio Consumer Council, the Ohio Consumer Advocate, which outlined the Bell's ISDN deployment schedule. There was supposed to have been approximately 340,000 customer lines by 1992, (which did not

exist according to the FCC and other statistics), while the company would have almost 2.5 million subscribers by 1996. (119)

Exhibit 17

"Ameritech ISDN Deployment, (Customer Lines), 1993"

1992	1993	1994	1995	1996
339,000	1,278,000	1,925,000	2,318,000	2,447,000

Below is the FCC's statistics for ISDN deployment for 1994 and 1995, representing three RBOCs. According to the FCC, Ameritech only had a total of about 50,000 lines in 1995, about 2% of the projected amount, while Pacific Telesis had only 34,000, and SBC not much more than that. (120)

EXHIBIT 18
ISDN Deployment for Specific RBOCs
(Year ending 12/95)

	1994	1995
Ameritech	41,744	48,622
Pacific Telesis	7,324	34,064
Southwestern Bell	1,595	34,628

Sources: FCC, 1995, NNI 1995

However, according to the FCC, some Southwestern Bell states, such as Kansas and Missouri had no single-line customers (known in the industry as "BRI") in 1994 or 1995. (121)

EXHIBIT 19

FCC Statistics: ISDN Lines, Kansas and Missouri 1994-1995

(for year ending December, 1995)

	1994	1995
Kansas	0	0
Missouri	0	0

NOTE: The FCC ISDN information never matches any of the information supplied by telephone companies in their annual reports .

Then there are the costs. Originally, ISDN was pitched as two telephone lines for the price of one. The next exhibit, also part of the Ameritech presentation, shows that the price of ISDN was supposed to be only $34, as compared to two residential lines, costing $41, actually saving 20%. (122)

EXHIBIT 20

Ameritech's ISDN Direct Cost Comparisons

Residence/Work At Home Application, 2/93

$41	**$34**
2 Residence Lines* (Voice and Data)	One Ameritech ISDN Direct Line* (Voice and Data)
* Usage charges apply	

The Rub: The Costs of ISDN — 1997

Though ISDN may be sold with a low cost figure for "basic service", no one pays this price, and the total per month can be prohibitive, hundreds of extra dollars per month.

- **First, there's the equipment:** This must include, besides a well-equipped computer, a special ISDN modem, costing $300-700 dollars.

• **Then there's the instillation:** Many times the house or office requires a total rewiring, and installation fees are not cheap. New York charges $234 for residential customers, $325 for businesses, not counting the actual rewiring. (123)

• **Next come the monthly charges:** On paper this can look reasonable. NYNEX New York charges only $24 a month for residential service, $35.23 for business. Ohio, on paper, charges $32.20 and $42.42 for business. However, there are caveats, meaning other charges. These can include: (124)

- "Residential monthly rates include a $6.70 recurring charge for the local loop",
- "Message rate service is $2.63 per b channel" (there are 2)
- "Distance Extension/XTN" may be applied when necessary at $26 a month." (125)

This means that besides the basic charge there are a host of other charges, which may apply, and they add an additional $30 a month. Also, the phone company considers this service to be two or more telephone lines and may charge the customer two or more times.

• **Then there's the actual calls:** Called "usage", these charges can add hundreds of dollars. Below is NYNEX's model for a five minute ISDN call. (126)

EXHIBIT 21

NYNEX's Typical 5 Minute Call In NYC Using ISDN, 1997

"This example demonstrates the charges for a five minute 128-Kbps data call within New York City, New York."

First three minutes	$0.080
Additional two minutes	$0.026
Time charge (five minutes)	$0.106
Circuit switched data charge (five minutes @ $0.01)	$0.050
Subtotal	$0.156
128-Kbps call uses 2 channels	(x2)
Total	$0.312

The example shows that a five minute call using ISDN costs the customer 32¢. Since the charges are for "Measured Service", the charges are per minute, plus something called a "circuit switched data charge" and then everything is multiplied by two — for the two B channels. Also, all of the charges are 'rounded up', even though they are fractions of a cent.

For 40 hours that's **$143.60 a month in just usage charges, not counting taxes, which adds 18%**. Remember, anyone who is getting ISDN must be, by definition, a heavy user of telecom services, including online services.

To add insult to injury, NYNEX goes on to show its total misunderstanding of the product with the following quote. It compares ISDN to a 1200 bps, (bits per second) baud modem, which was slow in 1992. Today's current standard speeds are 38,000-BPS or the faster 56,000-BPS for regular phone lines. (127)

128,000 bps ISDN service transmits data approximately 100 times faster than a 1200-bps modem, so a five minute ISDN data transfer would take approximately 50 minutes using a modem and analog service. Transmission costs: 31.2 cents for ISDN, $1.302 for analog. (Not to

> mention an additional 45 minutes of your time waiting for the data to arrive.)

Other pricing information from other states are not only prohibitive but the regulatory solutions seem to be equally bad. For example, the New Jersey Advocate states that Bell Atlantic's ISDN charges are "excessive", with prices from $23.50 to $249. a month. However, the Advocate's solution is for a $10 charge then a 25¢ a minute peak and 12.5¢ off peak. Considering that the average heavy online user uses 25-40 hours a week, (128) their pricing could cost over $300.

Scandal: ISDN Is Distance Sensitive. They Charge The Customer Extra For Their Inability To Deliver A Service Over Three Miles!

We mentioned it before, but it is an important point. Many customers have to spend extra on ISDN because they live three miles or more away from the company switch. This can add $25 a month or more for a "repeater, which boosts the signal. Other customers must pay for special "virtual" services in some states. Worse, some customers simply can't get ISDN at all because of the distance.

We believe that it has been and should be the phone companies' responsibilities to cover the distance sensitive costs. It is their failure to upgrade the network that results in additional costs.

And the Future of ISDN and Digital Services?

ISDN still has a lot of fans. For example, the New Jersey Rate Advocate, states that ISDN is still a 'vital' technology. (129)

> "According to the Advocate, ISDN will most likely play a vital role in the development of the 21st Century's telecommunications infrastructure. Since ISDN is the first end-to-end digital service offered to the residential customer by the exchange network, the Advocate believes it should be viewed as the "POTS" -plain old telephone service -- of the Information Age. ISDN is perhaps the only technology that can now be installed to allow every home in New Jersey to become part of a digital network. With

> its high-speed digital connections, ISDN will provide New Jersey residents with high-speed Internet access, CD-quality sound, video-conference and data transfer at speeds that are more than five times faster than that available with state-of-the-art modems. ISDN will allow computers to manage network connections and pave the way for a new generation of information services. ISDN will also allow a single line to support two telephone numbers and two simultaneous telephone calls."

First, and foremost, we believe that ISDN promises should be investigated both on a state and federal level for a massive failure to deploy promised advanced technologies, as well answering the basic question: State laws were modified to give the Bells funds to roll-out ISDN. It never occurred. Where's all the money?

Secondly, we are left with a technological dilemma. If ISDN still isn't working and the fiber-optic highway is doomed, what's next? Bob Metcalfe, inventor of the Ethernet and a founder of 3Com, believes that ISDN was too little too late, and while there are other technologies that are more advanced, he puts little hope in any of these visions of the future in the near term, primarily because the phone companies, "Telopolies", will fight to stop them from being deployed. Competition of advanced technologies is the only way to go. (130)

> "ISDN, from the telopolies, would have been a great advance in the 1980s. Today, ISDN at 128kbs is looking too little too late. Worse, ISDN goes through voice switching systems, which makes it too expensive.
>
> "DSL, digital subscriber lines, are a way of moving more data (mbps) over installed telephone wiring. This is our best hope for the near term, but the telopolies are not deploying XDSL, except to provide old-fashion technology (1.544mbps T1 service) for which without competition they charge us through the nose. And the telopolies are viciously fighting to keep competitors from installing XDSL around them. It's not a pretty sight. Not nice.
>
> "Cable TV modems are another alternative, but they don't work, or not yet in scale anyway. And the cable TV companies seem to lack the cash flow to invest in the cable upgrades required. Let's keep rooting them on.

"And then there's other: terrestrial wireless, geostationary, middle earth orbiting, and low earth orbiting satellite constellations, powerline data transmission, and the long-term winner, fiber optics everywhere.

"Too bad that on all of these we can't really hold our breaths. The most important thing that we should not do about all these alternatives is let Washington conduct a study of which one to go with as a national priority, you know, like committing to have, say, cable modems in every school, library, and video arcade by 2002.

"The most important thing that we should do, as we've learned in Silicon Valley over the last several decades, is encourage these bandwidth alternatives to compete on a level playing field. Through such competition, I expect, we'll see the very gradual convergence of telephone, television, and Internet into a diverse and evolving digital infrastructure for the information age."