Enthusiasts, Deregulators, Guardians, and Skeptics: Contrasting Policy Viewpoints on the National Information Infrastructure

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Passage of the Telecommunications Act of 1996, and events leading up to it, brought to public attention a proposed National Information Infrastructure (NII) that would connect homes, businesses, universities, schools, and government offices. The policy discourse surrounding the Act reveals a variety of perspectives among stakeholders, including the Clinton administration, federal agencies, Congress, telephone companies, the computer industry, broadcast and cable TV companies, educators, and other interest groups.

While there are many reports and commentaries on the NII, few authors have tried to characterize the political viewpoints behind the public discourse. This article reviews more than 80 NII-related documents, published from 1988 through 1997, and classifies their views and authors according to a two-dimensional typology by policy analyst William Dutton. Comparisons are made between those advocating Public versus Market leadership in NII development, and between Promotional and Restrictive statements regarding NII policy.

The Telecommunications Act of 1996 was a the most visible of a series of initiatives intended to create a proposed national infrastructure that would connect homes, businesses, universities, schools, and government offices through advanced telecommunications networks. Since 1988, hundreds of reports, articles and books have been written discussing, in some degree of depth, the resulting "Information Superhighway" and "National Information Infrastructure" (NII). (Since the NII-related literature is too large to review in this article, the reader is directed to other reviews, e.g., Bertot & McClure, 1996, and Kahin & Wilson, 1996.)

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Despite all of the reportage, commentary and speculation about what those technological artifacts *are*, or might *become*, there has been relatively little analysis of the political principles underlying a development of such importance. The majority of the documents on the Information Superhighway and the NII (which concepts, while not completely synonymous, are usually conflated in the literature and are treated together here) could be said to fall into two broad categories. Reports on the underlying technology and or its applications are easily the most numerous (e.g., EDUCOM, 1992; Kahin, 1992 , 1993; National Research Council, 1988, 1994).

A second category of documents concern social, economic and political issues (e.g., Dutton, 1996; Kubicek, Dutton, & Williams, 1997; Marien, 1996; Miller, 1996; Noll, 1996); a subset of the latter focus mostly on the personalities involved in the development of the NII (e.g., Auletta, 1997; Burstein & Kline, 1995; Maney, 1995).

Only a few authors have attempted to characterize the political viewpoints behind the public discourse regarding Information Superhighway development. Marien (1996), Miller (1996) and Dutton (1996), have each offered categorizations of the political goals and values represented in the many reports, testimonies and commentaries on the NII. Following a discussion of the definition and history of the NII, this article uses the two-dimensional typology of Dutton, Blumler, Garnham, Mansell, Cornford, and Peltu (1996) to review more than 80 NII-related documents and classify a subset of their authors based on their statements regarding technology policy.

THE MEANING AND ORIGIN OF THE NII

What is meant by the term "National Information Infrastructure"? As recently as five years ago, the definition of the NII was not clear. Lebow (1995, p. 275) quotes 1993 remarks by Congressman Edward Markey, then Chair of the House Subcommittee on Telecommunications and Finance: "The good news is that everyone in Congress is 100 percent behind the development of a national information infrastructure. The bad news is that nobody has the vaguest idea of what that means." Representative Markey was not alone: Toni Bearman (testimony quoted in National Commission on Libraries and Information Science, 1994, p. 13), says that Vice President Gore asked the initial 27 (later 36) members of the NII Advisory Council (NIIAC) to "define what is meant by 'NII'."

Eagan (1996, p. 53) defines the NII simply as "the U.S. government's vision of the future advanced public telecommunications network system." Griffith and Smith (1994, p. 93) repeat Vice President Gore's definition of the NII (found in Information Infrastructure Task Force, 1993 and 1994b) as "a seamless web of communications networks, computers, databases, and consumer electronics that will put vast amounts of information at users' fingertips," and note that"the 'information superhighway' and the NII have become virtually synonymous." Indeed,

reports sponsored by the federal government—from the NIIAC, the Information Infrastructure Task Force (IITF), the Office of Technology Assessment, and National Research Council—tend to use the terms "National Information Infrastructure" and "Information Superhighway" interchangeably even though the latter term long predates the former (see below).

How then has the Information Superhighway been defined? According to Dutton et al. (1996, p. 391), "In general terms, the 'information superhighway' can be defined as [a] network which delivers all kinds of electronic services—audio, video, text, and data—to households and business." Another policy analyst, Noll (1996), says that

> the definition of the superhighway is fuzzy, but it seems to refer to a telecommunication infrastructure that can deliver a wide variety of services, such as telemedicine, home banking, shopping, telecommuting, electronic mail, electronic data banks of information, video on demand, interactive entertainment, remote meter reading, and tele-education. (pp. 1-2)

Gore (1991a) is often given credit for coining the term "information superhighway" in 1979, although others (Heilemann, 1995, p. 218) suggest that he adopted it from somewhere else—probably from circa-1970 magazine articles about cable TV by journalist Ralph Lee Smith, or his subsequent book (Smith, 1972). Leiner et al. (1997) cite the National Research Council (NRC, 1988) report, *Towards a National Research Network,* as "influential on then Senator Al Gore...[as it] laid the networking foundation for the future information superhighway." Thus, the publication year of the NRC report serves as a starting point for examining the discourse of the NII.

By 1989, Gore was calling the Information Superhighway a "National Information Infrastructure" (Gore, 1991a) that would build on concurrent efforts to enhance research computing facilities. While the National Science Foundation denied that the proposed "National Research and Education Network" (NREN) would be the basis for the NII, the two concepts soon became conflated. A statement from the Electronic Frontier Foundation (quoted in EDUCOM, 1992) illustrates the conflation:

> In discussions about the...NREN, National Science Foundation officials have reiterated their intention that they are NOT building a national information structure.
>
> In a strict sense this is true, but in enacting the NREN legislation and taking the first implementation steps, the Congress and federal agencies are taking a critical step toward what we call the National Public Network, the vast web of information links evolving from computer and telephone systems. (pp. A143-A144)

The physical requirements of a faster public network were addressed with the passage of the High-Performance Computing Act of 1991 and the Communications Competitiveness and Infrastructure Modernization Act of 1991. In 1992, the attention of the Congress and executive branch shifted to a broader vision: that of the NII and what it could do for Americans.

By the end of 1992, mass media coverage of the information superhighway began to take off, as reflected in a bibliometric study by The Freedom Forum (1994): In July-August, 1992, there were only nine mentions of the NII or Information Superhighway in major newspapers, news magazines and TV news broadcasts; during January-February, 1993, there were 209 such stories; in September-October, 1993, the topic was covered 1,038 times; and during January-February, 1994, 2,816 stories appeared in the press and on the air. The Freedom Forum (1994) study shows that coverage dropped somewhat in mid-1994, but still continued at a higher level than in 1993. (Of the 12 synonyms tracked in the study, the term "NII" itself ranked sixth in popularity and accounted for less than 4% of the stories identified, with all other terms being variants of the word "highway".)

According to computer scientist Press (1993), a turning point in awareness of the Information Superhighway was its appearance as the cover story for both *Time* (April 12) and *Newsweek* (May 31) during 1993. Reporting on the NII was stimulated by the release of the first Clinton administration policy paper on the NII in February, 1993 (Clinton & Gore, 1993), and later by the proposed merger, in October, of Bell Atlantic and TCI (Freedom Forum, 1994, pp. 10-11).

The rapid evolution of both the terminology and policy outcomes between 1988 and 1994 led to uncertainty among writers regarding which "network" they should be writing about; an example is the article title"Scholarly electronic publishing on the Internet, the NREN and the NII" (Bailey, 1994) which covers all bases at once. Other writers of this stage made flat declarations, such as"the National Information Infrastructure, in fact...is the Internet" (Chapin, 1994, p. 16) or "if you have the Internet, you do not need much else to have the NII" (MIT Professor Andrew Lippman, quoted in National Research Council, 1996, p. 123).

POLICY DISCOURSE AND ITS SOURCES

The present investigation examines the evolution of national policy regarding the NII by comparing evaluative statements about its leadership, parallels and benefits. Following an explanation of the nature of policy discourse, a method of sampling published statements about the NII will be described. The quotations sampled will be classified on two dimensions according to a typology by Dutton et al. (1996).

Wells (1990) defines "Public policy discourse" as including "government reports, and serious journalism [that] respond to broad public concerns." According to her, "Public policy discourse is sometimes addressed to a general public; sometimes it is composed for other experts in a field of administration" (p. 147).

Most powerful in shaping opinions are high-ranking sources, such as politicians, business leaders, and "experts"; direct quotations of such "elite sources" are the most effective form of persuasion (van Dijk, 1988).

According to policy analyst Weiss (1983, p. 231), "the public policy positions taken by policy actors are the resultant of three sets of forces: their ideologies, their interests (e.g, in power, reputation, financial reward) and the information they have." And Weiss (1983, p. 239) also notes that "The distribution of power determines WHOSE ideology, interests and information will be dominant" (author's emphasis). Bekkers (1997, p. 170) believes that

> it is fruitful to identify the relevant social groups and tease out the interests, goals, and opinions. Every group defines the problem, and its resolution, from their own frame of reference. The strategic interaction between those groups, or stake-holders, leads to a shared and/or dominant definition of the problem and its technological solution.

Who are the social groups involved in the creation of policy messages regarding the NII? According to Cronberg (1997, p. 121), the first social actors to participate were "telecommunications agencies, computer engineers and future oriented researchers and writers such as Alvin Toffler" followed by the policy-makers and government officials concerned with planning, funding and implementing specific infrastructure projects.

Drake (1997, p. 175) notes that the popularity of the Internet raised new issues and broadened the agendas of many non-commercial stakeholders. When the Clinton administration began to push for the NII various public interest groups adopted the information superhighway as an umbrella to tie together various concerns, particularly the need to use new technology to "empower" individual citizens and other non-commerical interests; this resulted in quite a different policy environment than the usual one for determining telecommunications policy, in which the main interests to please were the telephone, broadcasting and cable TV interests.

Among the public interest groups that Drake (1997, p. 177) names as involved in infrastructure policy discussions are the Center for Media Education, Computer Professionals for Social Responsibility, the Electronic Frontier Foundation, the American Civil Liberties Union and the American Library Association; these groups accounted for much of the non-commercial lobbying of Congress in regards to NII-related issues. McDowell and Buchwald (1997) identify parallel groups engaged in policy discussions of the Canadian Information Highway.

Policy discourse about the NII has featured the views of various actors: The Clinton administration, individual federal agencies, Interagency Working Groups (e.g., IITF), Congress, telephone companies, the computer industry, TV cable companies, educators and many other public and private interest groups. Their views are expressed in policy documents, testimonies before Congress, trade books, the popular press, and professional journals, among other venues. Such policy discourse can be analyzed (Fairclough, 1992; Frohmann, 1994; Streeter,

1987) to suggest how representatives of government, industry, education and other interest groups shape our assumptions about the nature and value of the NII.

Indeed, the National Information Infrastructure Advisory Council (1996a, p. 82) of the National Telecommunications and Information Administration specifically advises the President that "The Administration must place a higher priority on finding ways to communicate effectively the benefits of the NII to the average American," a sentiment that NIIAC Co-Chair (and Silicon Graphics CEO) Edward McCracken expressed to Commerce Secretary Ron Brown in a letter reproduced in Information Infrastructure Task Force (1994b). So it is that policy messages may come full circle from citizens' representatives to the United States President and back again to the citizens.

CLASSIFYING POLICY VIEWPOINTS

One could contrast the views of policy stakeholders in a number of ways: utopian versus dystopian, optimistic versus pessimistic, libertarian versus regulatory, or public ownership versus private ownership, and so forth. Three typologies of political interests in the NII were considered in this investigation and are described below, in order of increasing complexity: Marien (1996), Miller (1996), and Dutton et al. (1996).

Marien (1996), in a lengthy "biblioessay" citing more than 200 documents, contrasts "information society enthusiasts" with "information society critics"; the enthusiasts are characterized as "technoleaders," futurists, business consultants, and political libertarians; the critics are composed of social scientists, communication scholars, political leftists, humanists, psychologists and "computer experts with no financial stake" in the NII. While these labels may be accurate so far as they identify the occupations of enthusiasts and critics, they do not clearly identify any principles on which each group bases its advocacy and/or criticism of the NII.

Miller (1996) identifies "five different political camps" in the debate over the NII:

- "Progressive Communitarians" (who stress a need for strong governmental leadership in concert with non-profit community groups);
- "Market Libertarians" (who believe in the effectiveness of small business initiatives and minimal governmental regulation);
- "Corporate Conservatives" (whose faith is in leadership by the nation's largest corporations, aided by favorable federal policies);
- "Mixed-Market Liberals" (who accept the for-profit sector as the dominant force in development, but believe that governmental should subsidize infrastructure and to meet the needs of low-income groups); and
- "State Socialists" (who hold that government should own infrastructures and manage the national economy).

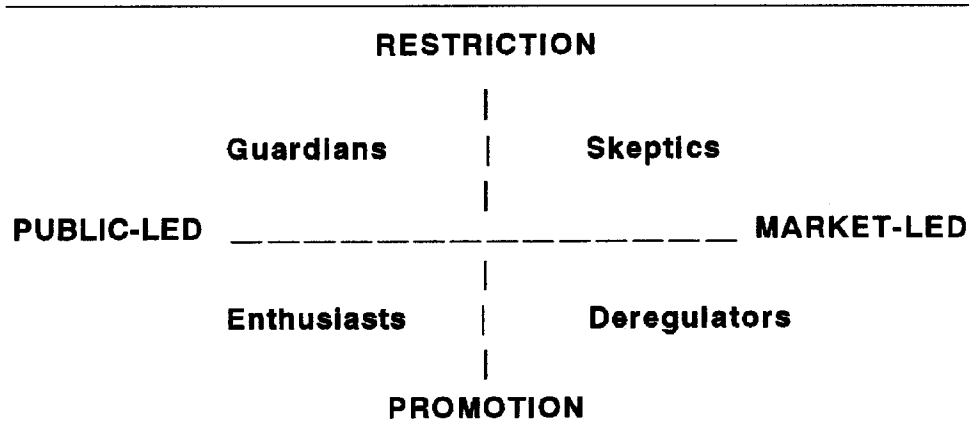
While Miller's five camps may be reflective of political ideology, they overemphasize the role at least one social group (State Socialists) whose numbers and influence in the United States have been minor compared to the other groups Miller identifies; virtually no one argues for complete state ownership of the facilities over which electronic services will travel, or for a centrally-managed economy.

Dutton et al. (1996, pp. 387-405) offer a multi-dimensional and more compelling analysis, regarding the development of any "Information and Communication Technologies" (ICTs) as reflective of four groups formed by contrasting political views on two dimensions: the degree to which the infrastructure should be (or is) a commercial initiative; and the degree to which it should be (or is) restricted by either public or private interests. Four cells are formed by an allegiance to a "Public-Led" versus a "Market-Led" network, crossed by a "Restriction" versus "Promotion" dimension.

The "Public-Led" viewpoint argues for a network designed with the public interest in mind, whether that be by government or non-governmental organizations or individuals. The "Market-Led" view point says that NII development ought to be left to market forces, based on demand and supply of equipment and services and with minimal governmental regulation.

The "Restriction" versus "Promotion" viewpoints are more subtle. The Restriction camp identifies those who argue that the NII will be subject to either too much regulation by the state, or too much manipulation by private companies; three examples of restriction include elimination of potential competitors by some private firms, through either monopolistic practices or advocacy of protective legislation; restraints on free speech, whether by government or private company; and over- promotion of unpopular services by suppliers attempting to create consumer demand. The Promotion viewpoint argues that the NII will be over-

FIGURE 1
Dutton et al.'s Dimensions of Policy Conflict



whelmingly beneficial for everyone despite any of the concerns voiced by the Restriction camp. Figure 1 illustrates Dutton et al.'s typology.

Figure 1 posits four idealized policy viewpoints, each identified by a descriptive label. Dutton et al. called the *Public-Restrictive* camp "Guardians," the *Public-Promotion* viewpoint "Enthusiasts," the *Market-Restrictive* group "Skeptics," and the *Market-Promotion* camp "Deregulators." Dutton et al. describe the four camps this way:

> "Enthusiasts" typically see the public sector playing a key role in fulfilling their belief in the importance of promoting the use of ICTs...Although "guardians" also see the need for public-led policies to harness the real momentum and potential of ICTs, they tend to see the public interest threatened by the development of an information superhighway, say in failing to share the benefits of the ICTs equitably across all sectors of society...The "skeptics" generally have argued that the superhighway is little more than 'hype,' driven by the supply industry and technological visionaries—rather than by real market demand from business or the public at large..."Deregulators" are also "enthusiasts" in terms of promoting the technology, but argue for "government to get out of the way" by removing constraints on business behavior through the undertaking of comprehensive deregulation. (pp. 389-390)

Can political views of the NII be categorized in this way? As useful as it is in characterizing the debate, Dutton et al. do not populate each of these camps with specific examples. This article attempts to use Dutton et al.'s typology to categorize policy discourse regarding the NII during the period of 1988 to 1997, as a framework in which to discuss the development of NII policy and to consider the validity of a typology for comparing policy viewpoints. Statements reflective of the four viewpoints have been identified in the professional and popular literature over that decade. Such documents can be viewed as a form of *persuasion,* resulting both in understanding and in actions congruent with that understanding.

ANALYZING DISCOURSE ABOUT THE NII

More than 80 commentaries on the NII, identified through online searches and the following of citations contained in books, articles and policy documents, were examined for the presence of evaluative statements about the NII. The methods of identifying and selecting statements are described below under "Sampling." Quotations are provided from the examined works, which are used to illustrate the themes evident in the statements of individuals representing certain types of organizations and social groups. The public statements of these various spokespeople are viewed as attempts to shape the National Information Infrastructure by charac-

terizing it as either predominantly Public- or Market-Led, and as subject to either Promotion or Restriction, along the lines of the Dutton et al. (1996) dimensions of policy conflict.

Sampling of Statements by Groups and Individuals

Given the huge amount of published information on the NII, any examination of the literature must be selective and therefore may suffer from bias and lack of representativeness. A framework was devised to guide the identification and selection of policy viewpoints regarding the NII, in an attempt to reduce, albeit not eliminate, investigator bias. Under this framework, the selection of statements used to illustrate contrasting points of view about the NII proceeded through four stages. While it is not possible to demonstrate absolute reliability in identifying all instances of discourse on a topic, all attempts were made to be systematic in locating relevant commentaries.

First, different communities of interest were identified, drawing on typologies used by authors of policy studies. Most of the social groups involved in the NII discourse are self-identified in the affiliations listed by authors in the documents examined in this analysis. The individuals and their organizations were grouped under four broad headings adapted from constituencies identified in Lamb (1996) and McClure, Bishop, Doty, & Rosenbaum (1991): government, business, education, public interest groups (representing Lamb's "citizens") and policy analysts; such a division parallels how the NIIAC itself (National Information Infrastructure Advisory Council—National Telecommunications and Information Administration, 1996a, p. 77) describes the relevant groups of "stakeholders...educators, librarians, community center directors, local government officials, and business leaders." To this list the NIIAC added (National Information Infrastructure Advisory Council—National Telecommunications and Information Administration, 1996b, p. 82), "The Public" and "Individuals and organizations that represent labor, consumers...user groups and others." Second, individual spokespeople for those groups were identified by a high rate of citation, holding of a relevant public or private office, and/or by authorship of an NII-related document.

Five means were used to identify and select individual opinion leaders and their statements regarding the NII and are listed in order of importance: (1) Exhaustive searches of NEXIS and selected Dialog databases by researchers at the Freedom Forum (1994), with the aim of identifying the individuals most frequently cited or quoted in discussions of the NII in a broad spectrum of popular newspapers and magazines over a three-year period and tens of thousands of articles; (2) Membership on the 36-member National Information Infrastructure Advisory Council (NIIAC), created by President Clinton in 1994; (3) Testimony before Congress in the "National Communications Infrastructure" hearings of 1993 and 1994; (4) Authorship of a recent book devoted to Information Superhighway issues, or authorship of some other widely-cited NII-related document (e.g., Noll, 1996; Toffler of Dyson, Gilder, Keyworth, & Toffler, 1995); and (5) Prominence in the

documents identified under the previous means (e.g., the key players in NII policy profiled in books by Auletta, 1997; Burstein & Kline, 1995).

Third, and overlapping with the second stage, prominent documents about the NII were identified, starting with the reports sponsored by the federal government (e.g., NIIAC, Information Infrastructure Task Force, Office of Technology Assessment, National Science Foundation and National Research Council) and independent policy groups (e.g., the Electronic Frontier Foundation, the Progress and Freedom Foundation, or the Institute for Information Studies/Aspen Institute), and supplemented by online searches for additional documents written by individuals named in those initial documents, and searches for other documents on the NII.

Finally, evaluative comments on the NII by the previously-identified individuals were located through close-reading of the documents identified. Since this is the most subjective stage, several constraints must be pointed out. First, this analysis is based upon documents, and yet not all of the individuals connected with the NII have made published comments on the NII; for example, President Clinton is strongly identified with building a national information infrastructure but has published little about it under his own name; similarly, CEOs like Ray Smith and John Malone have made attributable statements about the NII only in the context of published interviews and news reports. Second, only evaluative or speculative comments about the NII were selected; for example, descriptive statements about the types of equipment or technical capabilities necessary for a national infrastructure are not quoted here, as they do not speak to the leadership or benefits of the NII; technical statements make up the bulk of published documents on the NII.

This article contains quotations from nine of the top twelve personalities identified in The Freedom Forum (1994) study as having been associated with development of the NII; these spokespeople include, in order of frequency, Vice President Albert Gore, Jr.; President William Clinton; John Malone; Bill Gates; Ed Markey; Reed Hundt; Barry Diller; Ray Smith; and John Sculley; together these individuals accounted for 88% of the associations in that study. The other three "top twelve" personalities, Rupert Murdoch, Senator Howard Metzenbaum and Sumner Redstone, together constituted approximately 9% of the mentions in the Freedom Forum study; since none of their personal comments on the NII were identified, and since their centrality to the issue has decreased, they are not quoted here. (The other nine persons identified in conjunction with the NII, each name appearing in print at least eight times over two years, together accounted for only about 6% of the total associations.)

That the individuals identified are both influential and associated with the NII cannot be doubted; they constitute a policy elite (Domhoff, 1990) where the information superhighway is concerned. They are frequently discussed together in documents and, indeed, sometimes mention each other in their statements. Three examples of the interconnection of those elites are:

- John Malone's imaginary conversation with Al Gore about building the NII, as reported by Kline (1994):

  > Listen, Al, I know you haven't asked for it, but we'll make a commitment to complete the job by the end of '96. All we need is a little help...you know, shoot Hundt! (p. 131)

- Bill Gates' e-mail to John Seabrook about joint ventures with TCI and Time Warner (Seabrook, 1994):

  > John [Malone of TCI] and Jerry [Levin of Time Warner] and I share a vision of what the Information Highway can become. Its an incredible opportunity for all 3 companies and we have been spending time to discussing [sic] how we might help each other. (p. 55)

- Ray Smith's colorful report of the failure of merger negotiations between Smith's Bell Atlantic and Malone's TCI (Kline, 1995):

  > John and I were just on a Networked Economy Conference panel together, and we were standing at the urinals talking about things, and Barry Diller comes in and stands between us. And Barry says, 'C'mon, you seem like such good friends. Just split the difference.' (p. 117)

All three of these examples happen to illustrate the "Deregulator," or Market-Promotion point of view under Dutton's typology.

Figure 2 identifies the persons from whom statements regarding the NII were selected, along with their institutional affiliations. As "institutionally privileged speakers," these individuals perform "serious speech acts" which have social consequences for the rest of us (Frohmann, 1994). Figure 2 matches the social groups and sub-groups to six representative spokespersons; those representatives are quoted directly, where possible, in the text that follows.

THE PUBLIC-LED VERSUS MARKET-LED DIMENSION

On this dimension the argument is whether the development of the NII is, or should be, dominated by market forces or by organizations and individuals acting in the public interest (e.g., federal, state, and local governments, and non-profit organizations). The actual debate over whether NII development would be led by the public sector or the marketplace was stillborn, as the size and economic realities of the task became quickly apparent in the early 1990s. Drake (1997, p. 177) identifies 1993 and 1994 as the "high point of public interest group influence on the NII debate." According to Drake, the November, 1994 elections spelled the

FIGURE 2
Sampled Social Groups, Organizations and Spokespeople in NII Discourse From 1988-1997

Social Group	*Affiliated Organization or Sub-Group*	*Representative Spokesperson*
Government	Clinton Administration	Vice-President Albert Gore[1, 3, 5]
	United States Congress	Rep. Ed Markey (D-MA)[1, 3, 5]
		Rep. Newt Gingrich (R-GA)[3, 5]
	Congressional Research Service	Policy Researcher Jane Griffith[6]
	Federal Communications Commission	Chairman Reed Hundt[1, 3, 5]
	United States Commerce Department	Senior Official Thomas Sugrue[6]
Business	Bell Atlantic (Telephone)	CEO Ray Smith[1, 2, 5]
	TCI (Cable TV—network)	CEO John Malone[1, 5]
	QVC (Cable TV—network)	CEO Barry Diller[1, 5]
	Nickeloden, Disney/ABC (Broadcast & cable TV)	Pres. Geraldine Laybourne[5]
	Microsoft (Computer software)	President William Gates[1, 5]
	Silicon Graphics (Computer hardware)	CEO Edward McCracken[2]
Education	Columbia University	Prof. Bruce Egan[4]
	EDUCOM	Vice-Press. Michael Roberts[6]
	Georgetown University	Professor William Drake[4]
	Harvard University, Info. Infrastructure Project	Director Brain Kahin[4]
	University of Southern California	Prof. A. Michael Noll[4]
	University of Western Ontario	Prof. Bernd Frohmann[6]
Public Interest	Electronic Frontier Foundation (EFF)	Chair Mitch Kapor[2, 3, 5]
	Progress and Freedom Foundation	Esther Dyson[2,5]
	Center for Media Ed./Telecom. Policy Roundtable	Exec. Dir. Jeffrey Chester[3]
		former Chairperson Jeff Johnson[6]
	Computer Professionals for Social Responsibility	Director Andrew Magpantay[6]
		Vice-President Richard Adler[6]
	ALA Office for Information Technology	
	SeniorNet (non-profit educational network)	
Independent Policy Critics and Analysts	Authors mainly taking a Promotional view	Alvin Toffler[1, 4, 5], George Gilder[4,5]
	Authors mainly neutral in their reporting	Ken Auletta[1, 4], William Dutton[4]
	Authors mainly taking a Restrictional view	David Kline[4], Steven Miller[4]

Note: [1]Among the 19 personalities identified in The Freedom Forum (19994) study as associated with the NII. Gore, Clinton, Malone, Gates and Diller were the top five.
[2]Appointed to the National Information Infrastructure Advisory Council.
[3]Participated in 1993 Congressional Hearings on the "National Communication Infrastructure."
[4]Authors of book(s) or report(s) on the development of the information superhighway.
[5]Profiled in Auletta's and/or Burstein and Kline's books on NII personalities.
[6]Included to provide a diversity of viewpoints within each group.

end of public interest group input. In January, 1995, New Speaker of the House Newt Gingrich held closed-door meetings with telecommunications company executives to solicit advice about what provisions should appear in the Telecommunications Act of 1996; relatively few public interest groups were allowed to testify in the hearings for the 1995 House and Senate versions of the Act. As a result the public interest initiatives that survived were relatively noncontroversial items such as discounted rates for schools and the promotion of universal access in rural areas.

Still, it is possible to trace and characterize the nature of this debate through the published statements of spokespeople for the various interest groups. In particular, statements from both Promotional and Restrictional viewpoints emphasized, or at least admitted, the impossibility of complete federal funding of the NII. And the analogies used for describing the NII implied a type of leadership (or even ownership) of the emerging Information Superhighway.

Who would pay for the construction of the NII was not a forgone conclusion in early discussions. Was it to be a massive public works project? Statements made by Gore in the course of the 1992 Presidential campaign led some citizens to that conclusion.

Electronic Frontier Foundation representative Mitch Kapor (1993, p. 54) reports the concern of AT&T's Chairman Robert Allen that "the government itself was planning to build and operate the 'information superhighways' being promoted by Vice President Gore." Private sector worries about federal intrusion led to public statements by Gore himself, in March of 1993, that the United States government had no plans to construct a nation-wide, fiber-optic network, but rather were interested only setting standards and funding research and development efforts. Vice-President Gore exclaimed that:

> The idea of the federal government constructing, owning, and operating a nationwide fiber-optic network to the home is a straw man.... it is a phony choice that some people see between a federal public network and no federal involvement at all. (Kapor, 1993, pp. 54-55)

To which Kapor adds:

> The information super-highways sound bite took on a life of its own in the media. But taming the budget deficit made the idea of a government-backed network costing hundreds of billions of dollars beyond practical consideration, and the ideological debate about public versus private financing was never fully developed. (p. 54)

Despite signals from the Clinton administration that private development was preferable to full-scale public investment, representatives of public interest groups warned against potential problems with the role given to the private sector. Jeff Chester, Executive Director of the Center for Media Education and co-founder of the Telecommunications Policy Roundtable coalition of more than 90 non-profit organizations, warned that

> the communications system may more closely resemble a patchwork of private toll roads of varying quality and design....Without Federal intervention, control of the Nation's media system will be in the hands of fewer and less accountable companies possessing even more concentrated power. A number of critical safeguards are needed. (United States Congress, 1994, pp. 440-441)

Later a member of the Clinton administration would clarify their statements regarding a public network; Dutton et al. (1996) quote a spokesman for Vice-President Gore as saying:

> This metaphorical connection between interstate highways and information superhighways was a useful means of implying that many beneficial secondary economic impacts would result from the NII, which helped to gain support for the programme...However, the metaphor might have also suggested that the government's role could be the same as in the 1950s...That is absolutely not the case. (p. 394)

Business Professor Bruce Egan (1994), describing the lack of investment in public networks in spite of intense Information Superhighway rhetoric from both the public and private sector, explains that

> all the private sector is really convinced of is that direct government involvement is the worst that could happen and anything that can be said to prevent that involvement is good for business. I, for one, would not disagree. (p. 575)

Not surprisingly, Microsoft President Bill Gates (1995a) defends the American decision to place NII development largely in the private sector:

> A government bootstrap could, in principle, cause an information highway to be built sooner than might happen otherwise, but the very real possibility of an unattractive outcome has to be considered. . .a boondoggle, white-elephant information highway.

Gates' partnership with TV cable company TCI represents a competition with the telephone companies to provide a private infrastructure for the information highway. As TCI head John Malone says (Kline, 1994):

> We're the guys building it....by the end of '96, we'll be completely done in terms of fiber and coaxed deployment—the terrestrial network that is the superhighway. Five hundred channels of interactivity. We'll be done except for the terminals...which we are testing with Bill Gates. (p. 130)

Eventually the NIIAC, two-thirds of whose membership came from the private sector, made it quite clear what a limited role the federal government would have in this arena (National Information Infrastructure Advisory Council, 1996a):

> The private sector must have primary responsibility for the continued design, deployment, and operation of the Information Superhighway. The Information Superhighway can enhance and improve business opportunities by sparking a new wave of entrepreneurship and innovation. This wave will also create and transform products, industries, and

> jobs...the private sector should take a leadership role in working with the government in the continued development of innovative uses for the Information Superhighway in socially beneficial areas such as education.... (p. 9)

THE PROMOTION VERSUS RESTRICTION DIMENSION

The quotations above reveal contrasting arguments, during the early 1990s, regarding the *leadership* of the NII. It can be seen that few argued for outright public ownership of the NII, although many argued for public leadership in its development.

In examining the evaluative statements made about the Leadership dimension of NII policy, it was noted that the relative importance of Public versus Private Leadership was often argued using analogies. Therefore, contrasts in the use of analogies will be used here to illustrate the arguments about both leadership and the benefits associated with the NII; this will be followed by a discussion of statements solely about NII benefits or problems.

A Note Regarding Analogies and Metaphors

Properly speaking, most of the discourse about the NII is analogical, rather than metaphorical. To say that information moves along wires like vehicles move along a highway is to draw an analogy; a classic example of analogy is "the heart is like a pump," which indicates that the functions of the two are similar. Most of the discussion regarding the NII makes use of a simple transportation analogy.

Metaphor, on the other hand, implies a conceptual leap, a higher level of abstraction, such as found in the phrase "food for thought." When Al Gore speaks of information as food (below) he is still relying on analogies. Nevertheless, conflation of these terms is common, and not only in discussions of the NII (witness the phrase "desktop metaphor" as commonly used in computer science). Therefore, the term "analogy" will be favored in the present examination of utterances.

Promotion Analogies (Enthusiasts and Deregulators)

Sirbu (1992) notes that it is popular to talk about "information infrastructure" as if it were either like a transportation system or a public utility. The eighteen, mostly Promotional, position papers gathered in the EDUCOM *Proceedings* (1992, p. ii) in support of the NREN contain *13* different "historical models," ranging from overarching analogies (e.g., transportation), to existing communication systems (e.g., the Corporation for Public Broadcasting), to specific legislation, such as the Interstate Highway Act.

Of the various analogies, transportation is, by far, the most commonly used by all camps. The prevalence of the transportation analogy is due largely to Vice-

President Gore (1991a, 1991b, 1992), who should certainly be counted as a Promoter. Gore's father was largely responsible for the funding of the interstate highway system in the United States during the middle years of this century, and the junior Gore aspired to a similar accomplishment (Dutton et al., 1996, p. 394). Just to cement such a connection, the Telecommunications Act of 1996 was signed with the same pen used by President Eisenhower to authorize the Interstate Highway Act in 1956.

Gore's favorite characterization of the NII is as an"information superhighway" (1991a, p. 21). The appeal of the "highway" analogy is obvious: highways carried cars and generated new forms of commerce and economic growth, while networks carrying data may do the same thing; both are channels of distribution. Highways brought us new freedoms and opportunities, as will the NII. There are also some similarities between the way that Congress responded to lobbying by auto makers, real estate developers and construction companies in the 1950s to pass the Interstate Highway Act, and the manner in which the telephone and cable TV companies have gathered support for deregulating and constructing telecommunications networks.

Gore has likened information to food in order to illustrate the importance he attaches to it: "Current U.S. information policy offers disturbing parallels to U.S. agricultural policy. Vast silos of grain are rotting in storage while millions starve to death...Likewise, storage bins of data coexist with ignorance and a hunger to solve the problems this world confronts" (Gore, 1991a, p. 22). Yet, Gore (1992, p. 201) also equates information with toxic waste: "Vast amounts of unused information ultimately become a kind of pollution...What if this toxic information leaks into the wrong places?"

While adopting the highway analogy himself, Microsoft's Bill Gates strikes a more cautionary note when he says that (1995b):

> Today's Internet is not the information highway I imagine, although you can think of it as the beginning of the highway. An analogy is the Oregon Trail. . . However many conclusions drawn from descriptions of the Oregon Trail would be misleading if applied to the future [information highway].

Other analogies for the NII are also transportation-oriented. The popular characterization of Internet use as "surfing" evokes a water travel analogy. For similar reasons, Clinton and Gore (1993) have analogized the NII to railroads as well as highways:

> Accelerating the introduction of an efficient, high-speed communication system can have the same effect on US economic and social development as public investment in the railroads had in the 19th century. (p. 16)

Dutton et al. (1996) conclude that:

> The strength of the information superhighway as a political metaphor is that it combines apparent simplicity with considerable ambiguity. The simplicity makes it easy to understand at one level and the ambiguity allows individuals and groups room to make their own interpretations. (p. 393)

In summary, a number of commentators on the NII have used analogies—particularly to highways—in a positive fashion. Like the other analogies employed—railroads, water travel, and trails—the implication is that systems of transportation facilitate both national economic growth and personal freedom.

Restricter Analogies (Skeptics and Guardians)

The dominant analogy of "transportation" has been attacked by those concerned about the possible dysfunctions of the NII—whether due to government interference or the power of the market. Transportation itself reveals many divergent technologies and needs—everything from bicycle paths to canals to airports. How can a single transportation system, such as a highway, capture the potential meanings of an "information infrastructure?" Adler (1994) notes that:

> Because the term is based on an analogy with physical transportation, it fails to suggest any of the distinctive new applications that the new technologies will make possible...although 'information highway' is colorful, it is such an oversimplification that it produces more confusion than enlightenment. (p. xxi)

If the economic benefits and social evolution are the same for the NII as for highways, Skeptics ask, does that also imply that there will be parallels to the dysfunction created by highways? For example, highways have contributed to the decline of the inner city (and its schools), air pollution, traffic jams, higher fatality rates, social alienation, and the decay of public transportation, among other problems. Will there be similar downsides to the NII? Noll (1996, p. 3) turns the analogy against itself when he says that "A fog is settling in over the superhighway, and a big crash is about to occur as all the greedy participants rush blindly along until they finally rear-end each other."

Members of the Clinton administration admitted that the analogy invited criticism as well as enthusiasm; Commerce Department official Thomas Sugrue (1994) noted that:

> Within the government, many of us were so taken with the superhighway analogy, that we began to rack our brains for ways to extend the

> image. Certain kinds of communications were compared to off-ramps or different styles of roads....Opponents began to use the metaphor against us, saying, for example, there was no need to build six-lane expressways to everyone's driveway. Finally, the use of the highway analogy engendered considerable confusion about the role of government in the process....The metaphor was overtaking reality. (p. 18)

Among the most compelling criticisms of the highway analogy is that it implies that the NII will be free, and that it is easily accessible to virtually everyone. The American Library Association's J. Andrew Magpantay (1994, p. 32) resists the highway analogy as implying "a public good" that may not exist.

Most Skeptics and Guardians resist the use of any analogy for such an important policy initiative. Observers from higher education tend to be particularly critical: The Director of the Information Infrastructure Project at Harvard University, Brian Kahin (1993, pp. 54-55), points out that while we are being distracted by "the superhighway metaphor" of competition among "big dumb pipes" that transport content, patents on the software functions of the NII mean that "huge chunks of infrastructure are being snatched away" from the public domain. As well, EDUCOM Vice-President Michael Roberts (quoted in National Research Council, 1996) warns that:

> The NII cannot possibly be the sum of all our expectations for a better society based on improved communications and electronic information...be cautious in using terms that have been captured by social and political visionaries and already have emotional baggage attached. (p. 3)

Thus, the Restrictive spokespeople argue on two levels: (1) that the dominant NII analogy both overstates the value of highways while it minimizes their negative aspects; and (2) that any analogy can hinder a discussion as well as enable it.

The struggle over the meaning of the dominant analogy for the NII—the highway—reflects an ideological battle over the role of the state in public life. Buried in the arguments about the appropriateness of analogies to transportation systems are important political questions: How is a policy debate slanted through the choice of an analogy? Who decides what a public utility should do, look like, and cost? Whose needs are considered and addressed in the building of an information infrastructure? How does a society weigh potentially positive effects against possible negative outcomes? How can a society preserve its values and traditions while simultaneously promoting economic growth?

Undoubtedly, the highway analogy was chosen for several reasons: it has both structural similarities to communication networks and an obvious role for government in coordinating their development, while at the same time connoting freedom for individuals to choose, to grow, to *go*.

Anyone remotely suspicious of the motives of either government or business can seize upon the negative connotations of any analogy employed in a policy debate. Highways happen to be an easy target, given their associations with accidents, pollution, over-development and so forth. So it is not surprising that discussions of the NII have bogged down in an argument about what "highways" *really mean.*

To explore differing opinions about whether the NII was worthy of *promotion,* statements regarding the potential *benefits* of the information superhighway were examined; the quotations selected discuss the likely content of NII resources, their value—either in the commercial market or in the public sphere—and the anticipated effects of making that content available.

PROMOTING THE NII

The two potential benefits most frequently attributed to the NII concern education and commerce. Others include improved health care services, revitalization of civil discourse and democracy, more entertainment and general enrichment of living.

About the potential for an expanded economy, former Apple Computer head John Sculley has exclaimed "We're talking about a $3.5 trillion technology business by the year 2000. It's the mother of all industries" (Burstein & Kline, 1995, pp. 34, 260). Sculley arrived at his figure by adding up projected revenues for computer software and hardware, telecommunications, entertainment, publishing, and current or potential online shopping revenues, among other sectors of the economy, to conclude that roughly half of the United States Gross Domestic Product would in some way be related to the Information Superhighway.

Regarding political revitalization, George Gilder (according to Burstein & Kline, "perhaps the most influential of the techno-idealists") foresees "a cultural renaissance and a rebirth of town hall democracy via cyberspace" (Burstein & Kline, 1995, pp. 4-5). Gilder (1992, p. 18) predicts that cyberspace will "enrich and strengthen democracy and capitalism," a theme also echoed in his "Magna Carta for the Knowledge Age" (Dyson, Gilder, Keyworth, & Toffler, 1994).

Despite the obvious importance of the NII to the economy, improvement in education is the benefit most frequently featured in NII commentaries. In 1991, Senator Albert Gore published an article in *Scientific American* that is probably the single most widely-cited piece about the NII. In it he wrote that "Today a child can go to a library and use a computer to get the title of a book. A faster network would bring the book to the child at home, pictures and all" (1991b, p. 111). Gilder (1992, p. 33) describes the power of telecommunications to "revitalize public education by bringing the best teachers in the country to classrooms everywhere."

Representatives of the Electronic Frontier Foundation suggested that (EDUCOM, 1992):

> By the end of the next decade, these links will connect nearly all homes and businesses in the U.S. They will serve as the main channels for commerce, learning, education, and entertainment in our society. (p. A144)

Bell Atlantic Chairman Ray Smith is quoted by Dholakia, Mundorf, and Dohlakia (1996, pp. 96-97) as saying in 1994 that "We stand on the verge of a great flowering of intellectual property, a true Renaissance that will unleash the creative energies of investors, entrepreneurs, hackers, artists and dreamers." More down-to-earth, QVC CEO Barry Diller (1995, p. 83) says simply that "We are on the brink of a great convergence—where the computer, the television, and the telephone will meet to create truly new communications products."

The Information Infrastructure Task Force (1994a), in their *NII Progress Report* claims that the NII will:

> reduce health care costs by some $36 billion per year, prepare our children for the knowledge-based economy of the 21st century, add more than $100 billion to our Gross Domestic Product over the next decade, and add 500,000 new jobs by 1996, while enhancing the quality of work life and forming a labor-management partnership. (pp. 10-11)

In Executive Order No. 12864, creating the National Information Infrastructure Advisory Council (NIIAC), President Clinton (1993, B78) set the agenda by praising "the benefits of the National Information Infrastructure, as measured by job creation, economic growth, increased productivity and enhanced quality of life." True to its charge, the National Information Infrastructure Advisory Council (1996, p. 9) straight-forwardly claims that "The Information Superhighway provides the infrastructure that enables enormous benefits in education, economic well-being, and quality of life." Similarly, FCC Chairman Reed Hundt is quoted (Freedom Forum, 1994, p. 30) as predicting that "today's problems in education, health care and job training can be directly addressed and substantially solved by the capabilities of the information superhighway."

The educational possibilities of the NII are, in particular, the subject of enthusiastic commentary. Microsoft President Gates (1996) predicts that "networked personal computers will dramatically improve educational and other opportunities." While he was Chairman of Apple Computer, John Sculley (United States Congress, 1993) testified before Congress that the NII would "enable fundamental changes in the way we educate our children" (p. 14) and described these scenarios:

> Students will use on-line electronic libraries in classrooms and at home to learn more about any topic...Through virtual laboratories, students will perform science experiments using equipment and facilities located anywhere in the United States...Students of all levels and ages, teach-

> ers, and experts will collaborate, in real time, via high speed networks, on a variety of learning projects. (p. 17)

Among the TV cable content providers is Geraldine Laybourne, Nickelodeon President and later President of Disney/ABC Cable networks (described by Auletta, 1997, pp. 249-252, as "the most powerful woman in the television industry"). Laybourne (1994) wrote a *Los Angeles Times* op-ed piece,"Let's Let the Kids Get On the Information Superhighway," in which she offered the following anecdotes:

> In experiments conducted by Nickelodeon and other companies, kids have already demonstrated their ability to push the use of television to its technological limits. We call these "dirt roads tests," and they indicate that the true programming breakthroughs that surface in the next decade are likely to come from kids....Shop classes, for example, have turned into high-tech laboratories where boys and girls design animation and build robots, cars and buildings with computers. (p. F3)

The "success stories" for educational technologies cited by the National Information Infrastructure Advisory Council, (1996b, pp. 33-77) are more down-to-earth: electronic mail discussions among teachers, parents and students; accessing remote weather data from schools; online answers to students' health questions; teleconferences with distant celebrities; electronic "fieldtrips" to geological or archeological sites; and simulations of natural and social processes.

Liberals and conservatives alike may be Promotional regarding the benefits of the NII. EDUCOM's Vice-President Michael Roberts (1994, p. 30) says that political liberals are "likely to view the NII as a major shift in the public-private balance in communications and an opportunity to redress some of the social failures of television and telecommunications."

On the conservative side, The Progress and Freedom Foundation (PFF), "a not-for-profit research and educational organization dedicated to creating a positive vision of the future" (Coyle, p. 77), advocates deregulation of telecommunications and the privatization of the NII in their document "A Magna Carta for the Knowledge Age" (Dyson, Gilder, Keyworth, & Toffler, 1994) as a boost to American productivity. In his enthusiasm, Gingrich went so far as to suggest to the House Ways and Means Committee "a tax credit for the poorest Americans to buy a laptop" (Burstein & Kline, 1995, p. 19; Heilemann, 1995, p. 224). In another statement of the PFF philosophy, Toffler and Toffler (1995) add that:

> The White House now is promoting its controversial plan for an 'Information superhighway.' Whatever we think of the plan or the metaphor, one thing is clear: electronic pathways form the essential infrastructure of the Third Wave economy. (p. 47)

In summary, Promotional views claim that the primary content of the NII would be both informational and educational, and would spur the growth of the economy through electronic commerce. The effects of such content would occur on two levels: For the individual, the NII would mean increased learning, more job opportunities, and great chances to interact with others towards social, economic and political goals. On the national level, the NII services would expand the economy, address social problems like poverty and social needs like education, and make the country more competitive internationally.

RESTRICTION OF THE NII

Promoters of new technologies are often wildly optimistic (West, 1996), and therefore it is easy for critics to point to their past failures in arguing that the NII has been "overhyped." Skeptics tend to attack the hype itself, claiming that there is little market demand for the more advanced functions of the NII and that the initiative is being pushed by the supply-side; Guardians tend to be concerned about either the potential for unequal benefits, or the potential harmful effects of the information superhighway. Guardians are more likely than Skeptics to acknowledge an upside to the NII, however. Mitch Kapor (1993), a co-founder of the Electronic Frontier Foundation, offers his "Jeffersonian Ideal" of what the NII *could* be:

> A National Information Infrastructure that promotes grass-roots democracy, diversity of users and manufacturers, true communication among the people, and all the dazzling goodies of home shopping, movies on demand, teleconferencing, and cheap, instant databases.... (p. 55)

Since education is the most frequent magnet for Promotional claims, it is not surprising that Restrictive statements would single out that realm for criticism. For example, Michael Noll (quoted in Groves, 1993, p. D4) points out that "Twenty years ago we talked about a wired nation, with linked classrooms, medical care for people in remote clinics, video phones. Here we are—all the same stuff again."

Other Skeptics point out that, even if connections to schools and libraries were provided for free, it is hardly the beginning of the real costs: "Bell Atlantic has agreed to provide access for 26,000 schools, but left unanswered is the question of who will pay for other equipment and training needed by the schools to use the superhighway" (Griffith & Smith, 1994, p. 95).

While the schools have been the focus of much of the rhetoric, the home audience is the real target of the information superhighway. Kapor describes a "worst case scenario" of what the NII could become for the home audience (1993):

> We could wind up with networks that have the principal effect of fostering addiction to a new generation of electronic narcotics...their prin-

> ciple themes revolving around instant gratification through sex, violence, or sexual violence; their uses and content determined by mega-corporations pushing mindless consumption of things that we don't need and aren't good for us. (pp. 54)

Computer Professionals for Social Responsibility (CPSR) board-member Steven Miller (1996, p. 11) supports the notion of corporate conspiracies: "Instead of a global village, the NII might be an opium den with 500 pipe stems." Miller also remarks (1996, p. 12) that the motivations of corporate proponents of the NII are obvious in their public statement; for instance, Bell Atlantic Chairperson Raymond Smith says that the NII will be financed by profits from home-shopping, video-on-demand, ads and games; Lippman (1994, p. D3) reported similar sentiments from QVC's Barry Diller, who described the information highway as offering the advantage of "buying underwear *in* your underwear."

Computer scientist (and former Chairperson of CPSR) Jeff Johnson (1996), whose views became more cynical in the face of corporate influence over the shape of telecommunications reform, predicts that:

> the Information Superhighway will be a highly commercial, top-down, "pay-per" system for delivering infotainment and advertising to consumers, and, of course, taking their product orders...The Information Superhighway will be controlled by the Fortune 500, which will design it for their own benefit. It will treat us as consumers to be targeted rather than as citizens to be connected.... (pp. 16-17)

Johnson is quoted by other sources (Miller, 1996) as using even more strident language:

> We hear almost exclusively about the wondrous benefits theInformation Highway will bring us—most of which are simply hyperbole, naivete, and outright lies....Another casualty of the Information Highway will be democracy....[It] will also be bad for your children...[who] will be subjected to a mind-numbing barrage of advertising—some of it masquerading as entertainment or educational material—designed to turn them into consuming machines. (pp. 341-342)

Frohmann (1994, p. 135) sees behind the NII commentary a drive to reinforce "the market imperatives of consumer capitalism...congenial to consumer consumption of the electronic information awaiting delivery via the 'electronic superhighway.'" Certainly, capitalism is heavily implicated in the building of the information highway. In the aftermath of nearly two million corporate layoffs in the United States between 1991 and 1996, critics worry about the economic impacts of the forces bringing the NII into existence. Burstein & Kline (1995, p.

336) expect a continued loss in United States jobs due to technological displacement, noting that "The very companies most closely associated with building the Information Highway have been among those shedding jobs in the biggest numbers."

In summary, Skeptical elements ridicule the current characterizations and "selling" of the NII. Relatedly, some Guardians see it is as enacting a capitalist agenda for restructuring the economy—to the detriment of the worker.

Promotional claims regarding economic and economic improvements are countered by advocates of Restriction. The Skeptic and Guardian statements warn that a networked economy may most benefit existing centers of wealth and power. Restrictional views run along a spectrum from merely implying that technological change tends to be hegemonic, to suggesting an outright conspiracy behind NII development that implicates both business and government.

SUMMARIZING THE DISCOURSE

Characterizations of the discourse are summarized in Figures 3 and 4. Figure 3 summarizes the perceived social, economic and political goals of the four sectors of society (government, business, educators, and citizens/public interest) discussed earlier. Figure 4 characterizes typical sentiments expressed in regards to the Leadership dimension (as it is expressed via analogies for the NII) and Promo-

FIGURE 3
Social Groups and the NII: Dominant Orientations and Goals

Social Group	*Sub-Groups*	*Typical Orientation (s) and Goals*
Government	Federal and State Agencies	**Enthusiasts** and **Deregulators** Reform (including reduction of regulation), Increase in Tax Revenue through Expansion of Economy, Self-Perpetuation of Regime, Regulation of Economy and Social Inequities, Expansion of Opportunities for citizens
Business	Telephone, Computer, Broadcasting, Financial, Information Industry	**Deregulators** Increase Profits, Avoid Regulation, Capture New Markets, Out-Maneuver Potential Competitors
Education	Educational Computing Organizations, Information Networks, and Individual Academics	**Enthusiasts** and **Guardians** Prepare Students for the Information-based Jobs and Technologies of the Future, Improve Learning among All Age Groups
Public Interest	Non-profit Organizations, Public Interest Groups, Non-affiliated critics	**Enthusiasts, Guardians** and **Skeptics** Maintain Civil Rights, Reduce Social Inequities, Increase Citizen Power and Participation in Governance, Promote Self-Expression
Policy Analysts	Authors of Books and Articles on NII Policy	**Deregulators, Enthusiasts, Guardians** and **Skeptics** Call Public Attention to Important Topics and Issues. Create Popular Documents that Influence Public Policy and Make Money for Authors and Publishers.

tion (as reflected in statements about potential Benefits—or problems—of the NII).

Regarding Figure 3, it can be seen that as far as *Promotional* visions of the NII are concerned, there is not much conflict among the goals of the four groups, especially between the strategies of governmental agencies and business concerns. The United States federal government has been reducing the amount of regulation since the early 1980s, which strategy fits with the goals of those businesses most heavily regulated; indeed, construction of the information highway seems to depend on opening certain areas of commerce, especially telephony, to intense competition. It is widely recognized among businesses that there will be "roadkill" in this process, but that the end result will be a larger pie for everyone; an expanded economy would allow an increase in tax revenue, improving the prospects for perpetuation of the administration that brings about such changes.

In contrast, other goals of the federal government (so frequently stated in the NIIAC and other federal documents) to expand opportunities and reduce inequities for the American population, are somewhat at odds with the goals of the business community. Telephone companies are losing their incentive to serve poorer populations, and instead are concerned about serving the wealthiest segments of the marketplace—those who can afford the latest devices and services. The debate about universal service provisions do not seem to reflect any federal commitment beyond guaranteeing the connection of schools, libraries and hospitals to the NII.

The Promotional talk of the government and business communities is, at times, congruent with that among educators and community groups. Some educators see their institutions as responsible for preparing students for employment, in line with the rhetoric of federal documents and commercial pronouncements. Public interest groups sometimes support the Promotional vision of an infrastructure that could provide more employment opportunities for the disadvantaged.

It is often the voice of citizen groups, particularly the grassroots public interest groups (e.g., Computer Professionals for Social Responsibility) that give rise to the

FIGURE 4
Contrasting Discourse about the NII

	Market-Led	*Public-Led*
Analogy	"Highway" is largely appropriate in its connotations of ready access and enhancemenet of individual freedom.	"Highway" is inappropriate as an analogy as it limits thinking about both potential applications and potential problems; falsely suggests free use of public system.
	Promotion	*Restriction*
Benefits (Anticipated Content and Effects)	Information, educational programming, public forums. Will increase democracy and empower citizens; will create jobs, prosperity, and increase efficiency of government and private sectors.	Entertainment programming, advertisements. Will control audiences to better sell products and services; will lead to increased alienation, job loss, degradation of work, greater concentration of welath and other social inequities.

Restrictive discourse. Their voices are not widely found in mainstream publications. They are concerned about possible erosions of civil rights, especially freedom of speech; the mergers and joint ventures that are deemed necessary for the building of the information highway have eroded a common carrier system of communication in which the providers of content were neatly separated from the providers of channels; that telephone companies may soon be providing both both content and conduit raises serious issues for free speech (Noam, 1993; Pool, 1983).

FIGURE 5
Classification of Some Spokespeople in Dutton et al.'s Typology

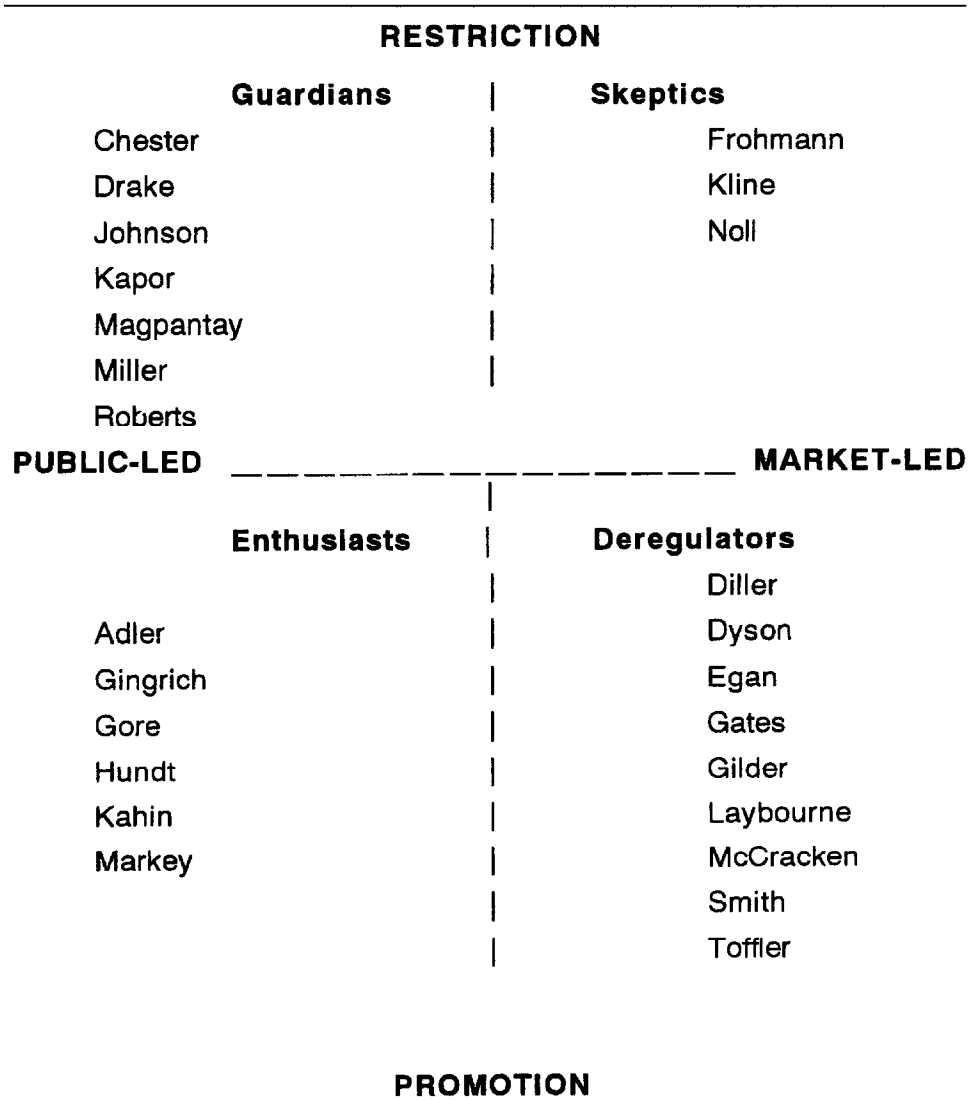


Figure 4 characterizes the idealized sentiments expressed in the literature examined, following Lamb's (1996) identification of "imperatives and expectations" present in discourse on technology. First, regarding the use of "highway" analogies, the Promotional expressions portray it as appropriate because it connotes a resource that is readily available to the public and which offers opportunities for personal growth and expression. In contrast, the Restrictive view characterizes the analogy as inappropriate because analogizing to highways may blind us to the ways in which the NII is *not* like a public transportation system, particularly in the sense that it is not "free," but rather requires a certain level of wealth and education to use effectively.

Regarding the real and projected content of the NII, the Promotional view is that it will consist of factual "information," opportunities for public exchange about important issues, and a considerable number of educational programs. The fears raised by Restrictional statements is that the Information Superhighway will be dominated by entertainment programming that is much like current television, including pervasive advertisements.

Figure 4 contrasts the anticipated effects expressed in the documents under study. The Promoter goals of the information highway are both economic and political; the NII is seen simultaneously stimulating the economy and fueling democratic institutions. Promoters say that the NII would result in greater efficiency in both the marketplace and the polling place. Restrictional sentiments paint the NII as yet another vehicle, not unlike current television broadcasting, by which to control audiences and sell products; the result of this, Restrictionists fear, would be social alienation (as users are increasingly home-bound and their experience with the world mediated by the network), degradation of work (as jobs become piecework accomplished from home), and an even greater division between rich and poor.

Finally, Figure 5 attempts to place authors of the cited quotations along the policy dimensions of the Dutton et al. typology. Individuals are placed in the four cells not only on the basis of the quotations included here, but also on the basis of their affiliations and accompanying statements in the works cited in this article. Since Dutton and his coauthors are quoted regarding their analysis of the rhetoric or history of the NII, rather than regarding their personal opinion about it, they are absent from the classification; likewise, Auletta, whose straightforward reporting has been relatively neutral, is not classified in Figure 5.

As can be seen, the sampled spokespeople are most likely to be classified as either Deregulators or Guardians. Indeed, arguments could be made for placing one or more of the Enthusiasts (e.g., Gingrich) in the Deregulator camp, and other Enthusiasts (e.g., Adler, 1994) in the Guardian category. The decision rule here was that if a spokesperson sees an important role for government in the NII, and does not characterize either the private sector or the government as posing serious threats to pursuit of liberty and happiness in cyberspace, then they are Enthusiasts. The relatively few spokesperson labeled as Skeptics had not only to criticize private sector manipulation of infrastructure policy and markets, but must also

express doubts about a public-led network, or at least suggest no alternate vision of a pro-social NII. In contrast, all of the Guardians have offered strongly positive scenarios of what the NII could be, if not dominated by either government or private sector.

CONSIDERING THE DUTTON TYPOLOGY

While superficially it seems easy to identify both dimensions among spokespersons, on closer examination both dimensions offer problems, particularly Promotion versus Restriction. This is primarily because of a vagueness regarding the exact meaning of Dutton et al.'s (1997) "Restriction" dimension. Restriction is not equivalent to "Regulation," yet overlaps with that concept. In their brief explanation, Dutton et al. imply that Restriction has to do, on the Public-Led side, with fears about potential harm brought about by the NII (or, at the least, inequitable benefits); therefore, regulation may be needed to reduce any harm and/or to share potential benefits. However, some libertarian elements see government as regulating too much (a belief they share with Deregulators); they want government to "get out of the way," believing that any restriction must originate from within self-governing communities. Ironically, many Deregulators have no problem with regulation, so long as it hinders their competitors rather than their own firms.

On the Market-Led side, it appears that Restrictive sentiments have more to do with the sentiment that the benefits of the NII are either over-stated or completely illusory—i.e., there is no proven market for the services that the NII would make possible. So in that sense "Restriction" implies more of an absence of Promotion, rather than a need for regulation by government.

Complicating the Promotion versus Restriction dimension is the distinction between content and conduit (Noam, 1993; Pool, 1983). "Guardians" may argue for Restriction in the limited sense of regulation of the terms and conditions of the conduit (i.e., the physical portion of the NII) so that certain people (e.g., the poor, or minority viewpoints) or purposes (e.g., education or health care) can be favored. However, Guardians would be opposed to the restriction of content (i.e., restrictions on speech), a type of regulation that some "Deregulators" probably would not mind so long as it did not interfere with their organization's ability to make a profit. So the Promotion versus Restriction dimension could benefit from a tighter definition, one that clearly separates the content issues from those of the conduit.

To a lesser degree, the Public versus Market Leadership dimension can also be hard to characterize, even when the spokesperson represents an organization that is unambiguously public or for-profit. Politicians and governmental bodies, in particular, want to please both sides of the fence, and therefore may make vague or contradictory statements regarding leadership of NII development. Clinton and Gore have made strongly pro-public-good arguments for the NII and yet have also promoted the idea of leaving its development almost entirely to the private sector. Publicly-sponsored bodies like the NIIAC and the IITF—dominated by represen-

tatives of the private sector—are other examples of groups that speak, at times, for both public and private leadership.

In general, it is difficult to classify a spokesperson, much less the group they represent, in just one of the four camps. It is sometimes the case that a spokesperson will argue more than one side of an issue; in an attempt to be objective, academic authors are often like that, as are politicians, who try to please several constituencies at once. One of the more ambiguous examples is that of Mitch Kapor, the Chairman of the Board of the Electronic Frontier Foundation, a non-profit public interest group, and the former CEO of Lotus Corporation, a for-profit software firm. While Kapor is clearly a believer in the potential public good of the NII, he has also made among the most compelling statements regarding its potential ill effects; Kapor is best characterized as a Guardian and yet his collective opinions contain some similarities with those of Deregulators and Enthusiasts.

Perhaps the shortcomings of the Dutton et al. typology come from its origins in a comparative study of cable TV policies (Dutton & Vedel, 1992); in those studies it was the physical infrastructure that was of prime importance, while messy content issues were not considered. Of course, any typology is likely to challenged by reality. Despite its drawbacks, Dutton's typology can serve as a starting point for making sense of the goals and values in play in the NII debate. Further applications may clarify the hypothetical dimensions regarding national technological initiatives by examining parallel developments to the NII in other countries.

CONCLUSION

The uncertainty of the market for information and communication services, along with sometimes conflicting demands placed on regulators and policy-makers, makes the future of the NII hard to predict. With such large amounts of money and power at stake, policy-making will not be completely principled and rational. At present policy statements appear to be exaggerating benefits or dangers in order to encourage social change.

Kling (1994, p. 167) has predicted an increase in social analyses of technology due to the need to "justify large expenditures on computing and telecommunications research [and] justifications for major national computerization programs, such as the High Performance Computing Initiative, the National Research and Education Network (NREN), and the National Information Infrastructure." Most social commentaries on computing and its effects, Kling predicted, are likely to be Promotional in nature.

Certainly it has been the case with the NII that Promotional visions have dominated, at least in the formative period of 1988-1992, when the leadership and purpose of the NII were the subject of intense discussion. What we saw during that period was the evolution of the meaning of the NII through discourse about its benefits and potential effects. Beginning in 1993, and increasingly so in 1994,

discourse took a turn towards the negative, and more in the direction of Restrictional commentary, as can be seen in the quotations identified above.

The passage of the Telecommunications Act of 1996 brought closure to the discourse about who and what was leading NII development. The recent stage of arguments about the NII have been focused on specific passages in the new Act, particularly about censorship, universal service and the nature of copyright. The passage of the Act brings us into a stage in which gradually some goals that seemed possible (e.g., universal service as it has been applied to telephony since the 1920s) may be closed off, while other options that seemed unlikely (e.g., censorship of messages traveling over phone lines) may become entrenched. As Noll (1996) says:

> The Communications Act of 1934 formally endorsed universal service and made it national policy. It is interesting that sixty years later, universal service—its definition and how to achieve it—is still an issue. (p. 135)

Future discourse regarding the NII may consist of a rear-guard action to defend the Guardian ideals that might yet be preserved: free speech, free information and free access; the discourse may include rationalizations about goals achieved or lost, and to revolve around court decisions affecting specific provisions of the 1996 Act, such as those regarding indecency and universal service. An example of this stage of discourse can be found in the recently-successful suit against the "decency" provisions of the Telecommunications Act, brought by the American Library Association (as the lead plaintiff), the Electronic Frontier Foundation and a consortia of consumer groups, internet service providers and online vendors of databases.

Being a type of national "infrastructure" that is not as concrete (literally!) as a highway, an airport or a bridge, discourse has played an important role in making the NII real and meaningful to the citizens who will use it. Dutton et al. (1996) has noted about the NII that

> The hype surrounding this kind of vision can—and did—lead to a mobilization of a broad spectrum of society for and against the policy and to forecasts that veered between over-optimistic images of a cyber-paradise and unduly pessimistic fears of a dystopian automated hell...Thus, words like 'information superhighway' can really matter because they influence actual developments. (p. 393)

Similarly, West (1996) and Krugman (1994) have pointed out how the rhetoric of "national competitiveness" as a policy goal led to major (and sometimes misguided) initiatives by countries across the globe.

As these authors suggest, *discourse matters.* It is not merely "talk." Policy debates motivate important social actors and make things happen. The NII, it is argued, is an especially good example of the role of discourse in policy-making.

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