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**Telecommunications Law & Economic Development:
A U.S. Perspective.**

by

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TELECOMMUNICATIONS LAW & ECONOMIC DEVELOPMENT: A U.S. PERSPECTIVE.

By Joseph Van Eaton & Nicholas P. Miller.¹

ABSTRACT

Experience in the U.S. and elsewhere indicates that the development of a robust information and communications technology ("ICT") infrastructure is a key to economic development. Experience also suggests that development of that infrastructure is dependent on the rule of law.

The harder question is: what rules of law encourage development of telecommunications infrastructure and services, and lead to the desired end result – overall economic development? This paper focuses on the essentials of a successful legal structure for regulating companies that provide telecommunications services or infrastructure, as opposed to focusing on the equally important legal structures essential to the ongoing use of telecommunications infrastructure (for example, legal structures defining property rights, including intellectual property rights, and individual rights, including privacy and contract rights). Consistent with the worldwide move toward privatization, the paper assumes a legal system under which services, infrastructure, or both are provided in part by private industry. It *does not* assume that services and infrastructure are provided *only* by private industry, and indeed, assumes that government and particularly local government may play a critical role in providing basic infrastructure.

Part I identifies some of the tensions between infrastructure and social developments and private v. public control. Part II explains that, while there are many potential ways to successfully structure a successful regulatory regime to address those tensions, several elements appear critical, among them (a) an independent regulatory body; (b) with defined rules and processes; (c) whose activities and decisions are open to public scrutiny and review; and which is (d) properly staffed and funded so that it is in a position to make appropriate, defensible and consistent decisions over time. As importantly, perhaps even most importantly, the agency must be constrained by rules which require it to consider and address not only the concerns of investors, but also the concerns of the general public. To put it another way, regulation amounts to a form of "social contract" under which a private company assumes certain obligations in return for the right to provide critical services. In order to retain its validity, regulation must strike an appropriate balance between the business goals and the social goals of the community.

The United States has been moving from a regulatory system where facilities were provided by regulated monopolies to a system that is designed to replace regulation with competition, subject to certain specific regulatory provisions designed to (a) protect the public interest while (b) allowing competition to develop. Part II addresses some of the critical questions that arise in

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such an environment, and asks the question: is it possible to manage competition in such a way to achieve the benefits of the marketplace without sacrificing social goals? We believe that the answer is yes, so long as basic infrastructure remains open – that is, is available for use on competitively neutral terms to anyone who wishes to use it to provide services. However, we also believe that there is a real risk that well-financed and powerful vertically integrated media companies can place themselves in a position to control vital infrastructure, with potentially disastrous results.

In Part III, we look at some practical developments in the U.S. (and elsewhere) that show what can be accomplished if basic infrastructure is open, and what may be necessary in order to ensure that telecommunications infrastructure is developed as quickly as possible. One of the problems with a deregulated regulatory regime is that money and investment (not surprisingly) flow to the locations where the highest returns can be earned. Since 1996, when U.S. law was reformed to adopt a pro-competitive, deregulatory approach to telecommunications regulation, we have seen significant competition develop in some parts of some communities, but very limited or no competition in other areas. In particular, the United States has seen a relatively slow roll-out of "broadband" Internet services as compared to certain other industrialized nations. Faced with (a) delays; and (b) requirements of businesses and schools for advanced Internet access, communities or local non-governmental organizations have begun to build or acquire their own infrastructure and to provide services themselves. What is particularly interesting is that in some cases, these community networks will be used to provide important services via a technology popularly known as "Wi-Fi." Wi-Fi systems are wireless systems, use an unlicensed portion of the radio spectrum and can be set up using exceptionally cheap equipment. We argue that the U.S. experience suggests it is important to allow for local entry into telecommunications markets; and to ensure that regulation is not used to shut down or encumber these types of public networks.

INTRODUCTION: Telecommunications, Economic Development and the Rule of Law.

It is widely recognized that the development of advanced ICT infrastructure and services is critical to worldwide economic development. It is precisely because ICT development is so critical that a World Summit on the Information Society was scheduled to convene this year under the high patronage of the UN Secretary-General to consider the impact of the ongoing information technology revolution on the international community and "to develop and foster a clear statement of political will and a concrete plan for achieving the goals of the information society."²

The complex dynamics associated with ICT development are reflected in the draft Declaration of Principles and Draft Action Plan for the summit, and the comments submitted on those two documents.³ The Declaration of Principles recognizes the importance of telecommunications

² "Basic Information : About WSIS," <http://www.itu.int/wsis/basic/about.html>. The summit was to be held in two phases, the first 10-12 December 2003 in Geneva, the second phase 16-18 November 2005 in Tunis.

³ Quotes in this paper are from the June 5, 2003 versions of those documents, which can be found at <http://www.itu.int/wsis/documents>.

technology to human development and human rights: "The Information Society should harness the power of ICTs to advance human development. We seek to build an Information Society that is inclusive, where all persons, without distinction of any kind, exercise their right to freedom of expression and their access to and use of [reliable] information..." One proposed paragraph of the Draft Action Plan emphasizes that the issue is not merely technological:

Information technology has emerged as an issue for international debate fairly recently. Many still treat it under purely technical approaches, limiting discussions to matters of bandwidth, accessibility, communication infrastructure and so on. This is clearly not sufficient. The plan of action should be organized around broad thematic areas of public policies that are particularly relevant to developing countries, such as education, health, employment, government efficiency, local content, social inclusion and the promotion of science, technology and innovation. Better connectivity infrastructure, however, is also a fundamental objective.

However, another proposed paragraph emphasizes: "Infrastructure is central to digital inclusion and is, perhaps, the most critical step in national ICT policy, requiring involvement of regulatory bodies and the private sector..."

The ultimate tension in the comments is between those paragraphs which prescribe social ends (an open, educated society where technology is widely dispersed and available at low cost, and where all peoples can participate as effective creators and consumers of information)⁴ and those discussing the means to that end (infrastructure development). Comments submitted on behalf of the Coordinating Committee of Business Interlocutors by Cid Torquato, Executive Director of the Brazilian Chamber of Electronic Commerce argued that "the documents fail to recognize the leadership of the private sector in the information society. The role of the private sector is significant as business is the driver of innovation and owner of the majority of infrastructure." The comments go on to urge that more weight and prioritization be given to "the essential nature of private investment" and to "public policies that are inviting of such investment."

One way to think about this tension is to ask: why does economic growth flow from investment in advanced telecommunications infrastructure? Not much more than a century ago, the telephone was an oddity, not a necessity. One could literally ask the question: what does a person in Washington D.C. really have to say to someone in Sydney? But there is little doubt that the introduction of the telephone spurred economic growth. The evidence is that the ICT revolution is doing the same. The key in both cases, as one recent article suggests, is

⁴ The papers recognize that dispersion of working technology requires more than placement of the facilities. Among other things, resources need to be devoted to training potential users so that they can use ICT to act effectively as producers and recipients of information. Some possible approaches to developing effective opportunities for public participation in the Information Age were discussed in a work paper presented to the WJA conference in Dublin in 2001, Van Eaton and Saurer, "ADVANCED COMMUNICATIONS AND THE PUBLIC TRUST: Law, Ethics, and Communication."

networking. Networking enables the rapid, effective sharing of information and skills without regard to geographic location. In the U.S. and elsewhere in the late 19th and early 20th century, the telephone provided a basic tool for effectively organizing and conducting business and government, and thus by its very nature contributed to productivity gains.⁵ But the telephone placed significant limits on what and how information could be conveyed. Computer technologies vastly expand how one can store and use information. Among other things, computer technologies allow one to store video, audio or text information in an electronic repository where it can be retrieved, manipulated and used by others at their convenience. Thus, one can store legal forms, which can then be retrieved electronically, filled out electronically and then filed electronically, increasing the ease with which a person can use the legal system, and avoiding costs and delays associated with obtaining, returning and storing paper documents. One can store video recordings of school classes, enabling a person who must work during the day to access educational information at night.

As more computers were networked -- tied together across great distances via the Internet -- human productivity increased. Crandall and Jackson argue that the increase in electronic networking in the U.S. accounted for a significant part of the difference in economic growth in the U.S. from 1995-2000 as compared to 1990-1995. In the first half of the 90's, in the United States, few businesses used the Internet; in the second half many did; by the end of the decade more than half of all U.S. households were connected to the Internet. Growth in output per unit of capital, materials and labor tripled between the first and second half of the 90's.

At the simplest level, then, social benefits, including economic benefits, flow from widespread universal distribution of ICT equipment and facilities, with users ultimately able to control and manipulate the content of the data transmitted via the network. On the other hand, corporate incentives for maximizing profits may push policy toward control or creation of bottlenecks either in transmission or content control which permit the entity controlling the bottlenecks to extract monopoly profits. Profit and return-on-investment potential may be maximized by limiting the distribution or uses of the network, at least in the short term.⁶ Hence, the tension reflected in the draft U.N. comments in some respects may be seen as a tension between the factors which drive individual companies to invest, and the factors that make development of ICT infrastructure and services most worthwhile to local communities.

The key to managing the tension is the rule of law -- the development of a set of guidelines which encourage investment in a manner designed to achieve social goals. This is recognized in a paragraph proposed by Switzerland for the Draft Declaration of Principles for the World Summit on the Information Society:

The rule of law is essential for the information society to become a sphere of confidence, trust and security, where the rights of individuals - and especially children - are protected, users are empowered to avoid harmful

⁵ Crandall and Jackson, "The 500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access."

⁶ Wallensten, Scott J., "Working Paper: Telecommunications Privatization in Developing Countries: the Real Effect of Exclusivity Periods" (October 2000).

content, and governance, administration and justice become more open and efficient. The rule of law will be a reality when state regulation, co-regulation and self-regulation work together to build a clear regulatory framework in the full respect of human rights....

The Draft Declaration goes on to assert, in various forms, that "governments need to create and foster a trustworthy, transparent, and non-discriminatory legal, regulatory and policy environment, capable of promoting technological innovation and competition."

The United States regulatory model, with some successes and failures, has traditionally been based upon that model, rather than a model of state-controlled provision of utility services.

PART I. Key Elements Of A Regulatory System: A U.S. Perspective.

Telecommunications restructuring was a world-wide phenomena in the 1990's, and continues today, as governments examine a range of alternatives to improve incentives for efficiency and consumer responsiveness in their telecommunications sectors. The restructuring actions fall within two broad categories: Opening the sector to additional participants besides the traditional monopoly telephone company; and reorganizing the traditional telephone company itself to make it more "commercial" in character.⁷ Whatever the form of restructuring, it is necessary that the government implement appropriate regulatory oversight of the restructured sector and company.

A. Restructuring Alone Is Insufficient.

Restructuring the telecommunications sector, including commercializing the telephone enterprise, addresses only half the problem. The other half is to maintain appropriate government controls over the telecommunications sector to ensure that the new restructuring does achieve the purposes intended by the government.

⁷ There is confusion in the literature and in professional discussions over the terms "commercialization," "restructuring," and "privatization." The authors will use the term "restructuring" to refer to any reorganization of either the monopoly telephone enterprise or the telecommunications sector. "Commercialization" will refer to any reorganization of a monopoly telephone enterprise intended to improve its responsiveness to consumer preferences. The term "privatization" will be used only when a restructuring includes the transfer of government property into the control and ownership of private individuals or enterprises. Restructuring alternatives range from the government's separating the post office function from the telephone enterprise to redefining the scope of the monopoly of the telephone enterprise and permitting other entities to enter telecommunications businesses. Commercialization can range from creating a separate government-owned company, to hiring private individuals as consultants and contract managers, to sharing profits with a foreign telephone company to manage the system, to selling part ownership of the company to raise capital, to selling controlling interest and management responsibility for the company to a foreign operator while retaining partial ownership for the benefit of employees and other domestic interests. Only these latter two examples can be properly referred to as privatizations.

Privatization of government-owned enterprises and withdrawal of government intervention in an economic sector has worked well in sectors and industries traditionally operated by non-governmental entities and subject to normal market-place competitive forces. But telecommunications is different. For example, competition usually does not exist to the local telephone distribution facility, or exists only in limited forms.⁸ This is true whether the telephone

⁸ Again, careful terminology is essential. The authors do not argue that telephone companies are free from competition, nor that all telecommunications services are monopolies. In fact, much of the business of a telephone company is subject to substantial competition. The problem is that the essential facility which most telecommunications services must use is available only from the local telephone company and is not subject to effective competition. That element is the local distribution twisted-wire pair. This "local telephone distribution facility" is an essential "bottleneck" facility which most telecommunications services and service providers who compete with the telephone company must use to reach their customers. See, e.g., Order, Civil Action No. 82-0192, U.S. Dist. Ct., D.C. (Sept. 10, 1987). In that opinion reviewing the effect of the 1983 divestiture of AT&T, Judge Harold Green rejected the Bell Operating Companies' (BOCs') claim that competitors were "bypassing" the local telephone distribution facility to a significant extent. The judge concluded that the local telephone facility remained a "bottleneck monopoly" whose control gave the BOC's the ability to manipulate and monopolize the entire telecommunications sector:

The complete lack of merit of arguments that economic, technological, or legal changes have substantially eroded or impaired the Regional Company bottleneck monopoly power is demonstrated by the fact that only one-tenth of one percent of interLATA [author's note: non-local] traffic volume, generated by one customer out of one million, is carried through non-Regional Company facilities to reach an inter-exchange carrier. . . . The Department of Justice found only twenty-four customers in the entire United States who managed to deliver their inter-exchange traffic directly to their interexchange carriers, bypassing the Regional Companies. . . . It is clear, therefore, and the Court finds, that no substantial competition exists at the present time in the local exchange service, and that the Regional Companies have retained control of the local bottlenecks.

Use of this bottleneck facility and the price paid for that access is subject to the discretion of the local telephone company. If the would-be service provider is unhappy with the terms of access or the price imposed by the telephone company, there is no alternative competitor ready and able to provide equivalent access at an equivalent price to the customer's premises.

The local loop is very different from long distance facilities in the United States, or packet-switched networks in Europe, or database services In Japan. Each of these is a competitive service offering or facility. But each must use the local telephone distribution facility to reach its customers.

enterprise is privately or publicly owned, whether it holds a legally mandated monopoly or is legally subject to full competition. A law switching a state-owned system to a private system will not create competition in any sense if the private actor has a monopoly as a matter of law. But it is also true that even a law opening a sector to competition does not *create* competition if the inherent economics of the marketplace do not support it. And even where competition can exist, recent U.S. experience suggests that the marketplace alone may not ensure that services are high quality, cheaply priced and universally available.

B. Restructuring Requires Regulation External To The Company.

In the 90's, the typical country seriously considering restructuring displayed a set of common characteristics. The government-owned telephone company had generally poor operating characteristics in the form of unresponsive service, undercapitalized investment, and an inefficient work force. Its pricing structure for services was badly distorted by political considerations to favor certain users, equipment manufacturers and/or labor groups. Normally, the central economic planners had identified the underdevelopment of the telecommunications sector as a major drag on general economic development. And the business community and local subscribers were expressing high levels of frustration with the inadequate service. This set of circumstances led to the real need to commercialize the company--to restructure so it operated like a business, not a government bureaucracy.

However, not every alternative will be better than the traditional government-run monopoly. Restructuring is pointless unless it holds the prospect of better serving several important and simultaneous goals. Any country has a right to expect the following benefits from commercialization:

- a. improved management and operational efficiency in the company resulting in reduced operating costs;
- b. improved strategic business planning and implementation of new technologies;

To be sure, the development of fiber optic wires terminated directly in buildings with high density telephone usage and various forms of wireless technologies are in some respects displacing or providing a substitute for elements of the traditional twisted wire pair copper local loop. The International Telecommunications Union statistics show that in 1991 there were about 16 million mobile subscribers worldwide and about 546 million main telephone lines. By 2001, only a decade later, the number of main telephone lines and mobile subscribers was about equal, and last year it is estimated that there were more mobile subscribers than main telephone lines. [http:// www.itu.int/itu-D/ict/statistics](http://www.itu.int/itu-D/ict/statistics). But the same entity may control wireless and wireline facilities; and wireless facilities are often dependent upon access to the local switched telephone network. Similarly, competitive local exchange companies (CLECs) have fought desperately to maintain their right to access and resell those local loops of the BOCs which serve CLEC customer locations. Fiber and high-speed wireless remain niche technologies that are not cost effective replacements to the traditional, pre-existing copper loop in many locations.

- c. accelerated investment in high capacity, high revenue services and improved services to business users;
- d. maintaining and expanding the asset value of the company;
- e. removing day-to-day operations from the national political process; and
- f. reducing financial demands on the company to support the national budget.

The country has additional expectations for its telephone service. Presumably, most countries will want:

- a. aggressive reinvestment of earned capital to expand the geographical reach and quality of the basic network;
- b. individual service prices to reflect the long-run average cost of that service;
- c. limited and occasional explicit subsidies to particular user groups, such as low density rural areas, where necessary to achieve an important national developmental or social equity goal;
- d. stable or reduced prices to all classes of customers; and
- e. expansion of competition throughout the telecommunications sector wherever possible to assure economically efficient allocation of resources by the sector.

Each item on these two lists, including the expansion of competition, promises to reduce the profitability of an operating monopoly in favor of expanding output. It is not reasonable to assume that a well-managed, strategically minded company would voluntarily undertake these actions which promise to reduce its net cash flow and its value to its owners.⁹

⁹ This point was graphically illustrated at an early point in the Argentine effort to privatize its national telephone company, ENTEL. Originally the national government had intended only to sell the company and did not intend to provide for effective continued regulation of the company after the sale. The government assumed the government's continued presence on the Board of Directors of the new company would assure compliance with the national interest in telecommunications sector development. In particular, all decisions on revisions of the new company's strategic plan, reinvestment and profit distribution were to be the sole discretion of its board -- making the board responsible for reconciling the company and national interests, a direct conflict with the board's main obligation of managing the company for the benefit of the owners. No one independent of the company was to be given authority to restrain the company's overall profitability. Even the accounting system, particularly regarding depreciation and cost allocation among services, was to be the sole discretion of the company, allowing it to play enormous games with tariffs and book values.

Adding efficiencies to the internal operations of the company by itself will not remove the monopoly power of the local exchange operator. Commercialization may provide the company the ability to generate greater profits. But the company has no incentive to apply those profits to broadly improved service or to reduce its prices to levels reflected by the cost of serving monopoly customers. As a result, commercialization without outside incentives to the company to be socially responsible can turn an inefficient operation into a politically intolerable one.¹⁰

Solving this dilemma is critical any telecommunications restructuring. Otherwise a country is doomed to swing between the pendulum extremes of socially unresponsive private operators and nationalized services. Governments must create a system of dual incentives. The company must be commercialized and given internal incentives to improve its operating efficiency as a business enterprise. And the government must accept its responsibility to set appropriate limits and guidelines for the company through external incentives which force actions by the company that will reduce the company's overall potential profitability as a monopoly. In other words, the company must be "regulated" on two fronts -- internally through profit maximization incentives, and externally through government imposed restrictions wherever internal profit maximization incentives do not correspond with the country's or the telecommunications sector's overall interests.

C. External Regulation Comes In Two Forms.

The best form of regulation of any business enterprise is the threat of effective competition in the marketplace. But as we have already suggested, it is not at all clear that essential portions of ICT

Fortunately, the government, accepting the advice of World Bank staff and the government's own consultants, corrected this deficiency before announcing the eventual terms of sale. The sale was conditioned on the new owners acknowledging and agreeing to yield to the mandates of a strong, independent regulatory agency overseeing the restructured telecommunications sector and the two new privatized telephone companies formed out of ENTEL.

¹⁰ Increasing the company's internal efficiency does not assure the company will share these benefits with its customers. Left to its own devices, the company will maximize profits through monopoly pricing behavior. It will invest limited capital to improve service to the small percentage of its customers, such as business users, willing to pay premium prices for quality facilities in the local exchange. It will avoid further investment and attempt to reduce operating expenditures associated with other customers less willing or able to pay these premium prices. The result can be a dramatic increase in the return on the limited amount of company invested capital. A few valued customers will get greatly improved service if they are willing to pay an extremely high price. But this price will not be "economically efficient," that is, it will be well above the actual costs of providing the service, and these inflated rates of return will not induce competitive entry because of the monopoly characteristics of the local exchange. All other customers will experience deteriorating service as the company refuses to invest capital that will not earn the same inflated rate of return. See, Bolter, McConnaughey, Kelsey, Telecommunications Policy for the 1990s and Beyond (1990) at 15-16. It is this monopolistic service and pricing behavior that created the pressure in the 1930's to nationalize public utilities, including telephone companies. It is important that countries avoid repeating the same mistakes.

infrastructure will face effective competition, or that competition alone can serve all the goals that government must ensure are served by its ICT systems. Where the marketplace cannot establish and enforce social equity and economically efficient resource allocation, the only alternative is for the government to establish the rules directly and then resolve complaints of violations of those rules.

Expressed in these terms, government regulation sounds like normal governmental action: adopt the law and then enforce it. But government, in the form of legislatures and courts, are slow moving, unable to draw narrow distinctions, and reactive to the loudest and most powerful political forces in the society. This is not a formula likely to be a close substitute for competition in compelling economically efficient behavior in the high tech, fast moving, and consumer driven world of telecommunications, much less a formula for effective distribution of low-cost services.

Telecommunications regulation requires a new, and lighter-handed government agent to exercise the traditional governmental powers of rulemaking and adjudication, The agent should:

- a. be independent of day-to-day government political pressure;
- b. be independent of the telephone company, and the users of the telephone company's services (including the government);
- c. provide a transparent, open, honest and accessible process for considering new rules and resolving disputes;
- d. perform competent analysis of all the relevant facts;
- e. be subject to the discipline of the national goals as expressed in statutes;
- f. give quick decisions consistent with the fast-changing nature of the telecommunications sector; and
- g. engage in consistent and predictable behavior that removes unnecessary risk and uncertainty from the sector.

It is disingenuous to suggest there is unanimity among the experienced nations about how to achieve all these goals all the time. Every nation that currently has a serious and credible independent regulatory agency overseeing the telecommunications sector, such as Great Britain, the United States, and Canada, has chosen somewhat different methods from the others.

But the successes show significant common denominators. The successful countries have created agencies that have a professional, politically independent staff paid adequate salaries, given adequate training, and held to the highest standards of civil service integrity and efficiency. The agencies are fully competent in the necessary disciplines of policy analysis; financial and accounting analysis; economic, legal, and engineering analysis. The agencies have created processes for receiving public comment and resolving complaints which both are fair and appear to be fair to the carriers and to the user community. And the agencies have complete access to the

information required to reach sound decisions and have mechanisms to assure this information is presented to the decisionmaker in a manner that does not give unfair advantage to the economically most powerful parties in the dispute.

Another common experience among the “success stories” is that not every story is a success. The best laboratories and computer analyses, the best salaries and working circumstances do not guarantee quality results. Only quality decisionmakers, given quality support, will perform reasonably well. As personnel change, even the best agencies ebb and flow in quality. So ultimately, the *sine qua non* of good regulation is a political commitment by the national government to appoint good people to run the regulatory agency, and then to stay out of the way as they do so.

D. Crucial Organization And Decision Elements Necessary For Successful Regulation.

Several crucial organization and decision elements are necessary for successful regulation. First, the agency has to be properly staffed and funded. It must be given strong, independent leadership by a credible and politically secure leader of national stature, Regulation of a national telephone company is a very complex political problem, and progressive decisions are impossible unless properly equipped persons of integrity and stature make the tough decisions independent of day-to-day political pressures.

Second, the agency must be given a definite legal mandate with stated national goals. This mandate should define the basic objectives for the telecommunications sector, the general sector framework, and the scope of discretion allowed the agency. The law should empower the agency to enforce its decisions and should command the fairest of procedures and processes. A key element of fairness is transparency in decision-making. That is, the rule of law should, among other things, ensure that there is notice of the issues to be addressed; ensure that stakeholders may participate in a fair and open decision-making process; and require that any decision be publicly announced, and the grounds for the decision articulated. This sort of process ensures that the agency decision may be reviewed in the court of public opinion and possibly by the legislative or judicial authorities. This places a check on agency discretion, discouraging arbitrary action by throwing sunlight on the decision-making process.

Third, there are difficult decisions as to the scope of monopoly and competition to be implemented as part of any restructuring. The typical developing country has significant problems associated with inadequate capitalization and an undeveloped basic wire network. The policy dilemma is how to get high quality business-oriented services up and operating quickly, relying on the forces of competition, while leaving enough of the core business available to the new telephone company to be able to generate the capital to expand and develop the entire network. In other words, a bright line between monopoly and competitive services is not self-evident. And the regulator must be given discretion to move this line as needed to take advantage of the benefits of competition, consistent with network development.

Fourth, specific devices should be created to prevent the agency from being captured by the interests of regulated companies.¹¹ The regulated company will push for less regulation and less competition to achieve higher cash flows and a higher telephone company value. The regulatory process has to balance this pressure with the need to truly protect consumers and to protect competitors of the telephone company from unfair business practices. A transparent process is critical to a fair system, as is a system that ensures that stakeholder interests are represented at the decision-making levels.

E. The Task Of Regulation

Effective regulation is a daunting task. The following is a sample and partial listing of necessary projects a country will face in organizing and starting-up a new telecommunications regulatory agency.

1. Prepare the proposed telecommunications sector rules with respect to:
 - a. pricing of services;
 - b. quality and conditions of service;
 - c. network interconnection;
 - d. provision of leased lines for resale;
 - e. approval of network facilities;
 - f. approval of resellers;
 - g. application of technical standards; and
 - h. sale of terminal equipment.
2. Identify the procedures, activities, functions and information necessary to undertake the above regulatory tasks.
3. Build a minimum core of expertise in four areas, viz.: (a) regulatory policy; (b) price, cost and financial analysis; (c) quality of service, investment program, technical equipment; and (d) administrative, legal and information systems.

¹¹ The economist and Nobel laureate George Stigler developed a theory of "regulatory capture" where regulators end up serving the interests of the regulated firms because those firms overwhelm opposing interests in the regulatory process with superior resources, familiarity with the process and political power. The major defense to this threat of "capture" is to protect the agency's independence rigorously and to equip all sides in a dispute with equivalent ability to argue before the agency. Then the agency will retain its power to decide hard cases, critically and independently.

4. Build a capability to develop and implement regulatory policies with respect to:
 - a. licensing of telecommunications networks facilities;
 - b. licensing of resellers and other competitive service providers;
 - c. provision of leased lines;
 - d. anticompetitive or unduly discriminatory behavior by facilities-based service providers;
 - e. network interconnection and revenue settlement arrangements; and
 - f. other regulatory issues.
5. Build a financial analytical capability to:
 - a. monitor, analyze and approve or reject tariff proposals; and
 - b. review financial projections of service providers and develop a financial model of the operating companies to forecast rates of return and other financial indicators, and review methodologies and estimate the costs of providing telecommunications services.
6. Build a capability to set criteria for service, investment program, technical standards and terminal equipment:
 - a. establish performance indicators and systems to monitor results;
 - b. assess the operating companies' investment program, depreciation and procurement policies; and
 - c. establish, monitor and enforce technical standards for networks (including national fundamental technical plans) and terminal equipment.
7. Build the necessary administrative, legal and information systems:
 - a. operate modern administrative systems for both externally oriented needs (e.g., processing of license applications, regulatory proceedings), and internal requirements (e.g., personnel, finance, supplies);
 - b. provide in-house legal advice and undertake legal actions in support of agency operations; and

- c. establish and maintain information systems to support the agency's operations.¹²

In the words of one U.S. regulator:

“It is no secret to any of us that regulation is not glamorous. . . . Organizational effectiveness is concerned with doing the right things. . . . Regulators need to be taking steps now to build an effective organization, one that is responsive to the changes coming in the next decade. Regulators must create an organizational vision and structure that will enrich and sustain the organization throughout the next decade. The process of organizational development is slow; results take time to generate. Steps which are taken now may not pay off for five or six years. However, if those steps are not taken, there will be a price to pay.”¹³

PART II. Critical Questions and How U.S. Policy Resolves Them.

As the above suggests, a regulatory system that promotes telecommunications development – and hence economic and social development – will need to address many critical policy and practical issues. In this section we focus three critical questions now facing U.S. policymakers.

1. Who should be subject to regulation, and what sort of regulation should apply?
2. What type of competition should be encouraged; and what speeds rapid deployment of "broadband" networks?
3. How do we provide universally available networks?

By broadband networks, we refer to networks capable of carrying bits of information to and from a user in very high volume. A true broadband network would permit the transmission of high resolution digital images in real time from one location (a rural doctor's office, for example) to a another location (an urban health center, for example), thus enabling such services as tele-medicine. Other applications include distance learning (allowing an educator at one location to interact with students at another, distant location) and videoconferencing. How telecommunications systems in the U.S. will develop, and who will reap the benefits of those systems may be decided by the resolution of these questions.

A. Background on U.S. Regulation.

1. *The regulating bodies.* One federal agency, the Federal Communications Commission, is primarily responsible for "regulating interstate and foreign commerce in communication by wire

¹² This list is the product of extensive work performed by Peter Smith of The World Bank staff. It should not be used without modification as a complete checklist. It does provide the reader a sense of the complexity and range of activity even the smallest regulatory agency will face.

¹³ Remarks by Sharon L. Nelson, Chairman, Washington Utilities and Transportation Commission, and President, National Association of Regulatory Utility Commissioners, before the National Convention of NARUC, 1990.

and radio so as to make available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges..."¹⁴ However, it is far from the only regulator of ICT facilities, equipment and services. Individual states regulate intrastate telephony-type services, and each state has its own regulatory regime for doing so, although federal law establishes some limits on state discretion. In most parts of the United States, local governments are responsible for authorizing cable television companies to use public property to deploy cable facilities, and setting terms and conditions under which those companies operate, subject to certain federal guidelines. In some states, local governments may also franchise and regulate telephony-type companies; in almost all states, local governments establish rules for maintenance and use of streets and rights of way by communications companies. That is to say, there are multiple levels of regulation, designed to ensure that companies serve national, regional and local goals, although in the event of a conflict, it is the national requirements that typically prevail as a matter of law. This section of the paper focuses on federal regulatory issues, although an important question in the U.S. system is always: what level of government should have primary responsibility for what regulatory actions? The importance of that question should not be underestimated, as it is may be the local government, for example, that has the best understanding of local communications/economic development needs.

2 *The basic federal structure of regulation.* The U.S. Communications Act of 1934, as amended, establishes different regulatory requirements for persons providing telecommunications services, for broadcasters, and for operators of cable television systems. The structure of the law, until recently, effectively resulted in a separation of markets. In most cases a company would not be providing telephone services in the same geographic market where it was providing cable service, or vice versa. In 1996, however, the Communications Act was significantly revised in an effort to break down barriers to entry in the communications marketplace.¹⁵ U.S. law now permits cable operators to offer telephone common carrier services, and telephone common carriers to offer cable services. Regulation follows the activity – to the extent a common carrier offers cable services, for example, it is subject to applicable federal, state and local cable regulations.

Title II of the federal Act regulates telecommunications services-- the transmission of information for hire for the public. Telephone companies engaged in interstate commerce are regulated by the federal government under this Title, as are certain other common carrier communication companies. Broadcasters are regulated under Title III of the federal act. Broadcast regulation is almost exclusively the concern of the national government. Cable systems are regulated under yet another Title, Title VI. While Title VI provides for some federal regulation of cable, most regulation actually occurs at the state or local level.

Under each of the regulatory models, providers are subject to requirements designed to protect the public. Title II, for example, establishes a system under which control of the conduit (the telephone wires) is theoretically separate from control of the content. Title II companies must

¹⁴ 47 U.S.C. § 151.

¹⁵ See Telecommunications Act of 1996, 110 Stat. 56.

carry traffic of the user's choosing from one point to another and must charge a non-discriminatory rate.¹⁶ The public interest is served by ensuring that basic elements of the network remain *open* and *available to all at uniform rates*. Broadcasters are licensed to provide services on various radio frequencies and control the content of the information broadcast. While a broadcaster has a theoretical obligation to produce information of interest to the area that it serves, and to cover issues of public importance fairly, in fact regulation of commercial broadcasters is very limited, and the public interest obligations are ill-defined and generally ineffectively enforced. The main obligation, effectively, is to provide a good signal to a defined service area at no charge to the recipients (other than the cost of buying the television receiving equipment). A cable system operator, unlike a telecommunications service provider, also has control of content and conduit on its systems with an important *caveat*. The operator may be required to set aside a portion of its system capacity for use by public, educational and government speakers; and may be required to provide, at no charge to users, the facilities and equipment required to enable these speakers to produce and transmit information via the cable system.¹⁷ The operator is prohibited from exercising editorial control over the content of the information transmitted on these so-called "access" channels. Under the cable model, facilities and communications pathways are provided at the local level to enable anyone to take advantage of the cable system's capabilities. Cable service, however, is provided for a subscription fee, and rate regulation of the service price is largely ineffective.

Each of the federal regulatory models implicitly or explicitly reflects a notion that, in return for the grant of certain benefits to the provider, the provider must return benefits to the public. In other words, providers assume a public trust, and may be subject to regulations that are not applied to businesses that do not receive benefits from the government. The public trust is designed to accomplish at least two important goals, although there is a large gap between the goal and the result. First, the models are designed to prevent a grantee from using its ownership of distribution systems to control communication and debate. Second, the models are designed to ensure that services are available throughout the nation, and can be used effectively to address local and regional issues.

B. Critical U.S. Policy Questions.

1. *Who should be regulated and how should they be regulated?* The outline above broadly defines who is regulated, but it is also important to understand who is *not* regulated. Indeed, that may be the critical question in a competitive Information Age.

The popularization of the term "ICT" implies a merger of computing and communications functions. But there is and has been an important distinction between the two functions. It was widely recognized (or assumed) in the United States that there would be a competitive market in the provision of computer hardware and software. Early on, the decision was made not to regulate this market. But that raised the question: where does one draw the line between the unregulated computer market and the traditional, regulated communications utility functions?

¹⁶ 47 U.S.C. § 202.

¹⁷ 47 U.S.C. § 531.

U.S. regulation of Title II telecommunications services drew a line in law between "transmission services" and "information" or "enhanced services."¹⁸ Transmission services basically involve only the real-time transportation of information from one point to another, and the signaling and control functions associated with providing the transportation pathway. A voice telephone call is the paradigm: the caller specifies where the call is to go, and determines its content. The company or companies providing the service merely provides carriage of the signal from one point to another. An information or enhanced service is anything else, including any storage and forwarding functions whether performed by the owner of the telecommunications network or by someone else. In the United States, Internet service provided via a dial-up modem could conceptually be treated, and traditionally has been treated as involving two different services: transport of the signal via the telephone line to a computer server; and providing access to the resources on the Internet via that server. The former is a telecommunications service, typically provided via the local telephone company. The latter is an information service, typically unregulated. Internet service providers (ISPs) are typically treated as if they provided only an information service. America Online, for example, is not regulated in the U.S. as a telecommunications company. The upshot of the lines drawn in the United States is that huge sectors of the economy that fall within the rubric "ICT" are subject to no regulation, or very limited regulation. But what makes it possible to draw that line is that the *unregulated* information service companies all have access to a base level of *regulated* transport-only services. To put it another way, U.S. policy has traditionally depended on requiring the incumbent telephone utilities to maintain an "open" basic transmission network where the owner might be able to set the transport price, but would not be able to mix regulated and unregulated services together. So, Verizon offers a service called "DSL" which provides high-speed access to the Internet over Verizon copper local loops. A competing company called Covad claims to also offer "DSL". But Covad can only reach its subscribers using Verizon's copper local loops and bundling those together with Covad's internet servers. A central issue now facing the FCC is what base level of transport and access Verizon should provide Covad and at what price. Verizon (and the other BOC's) argue strenuously that the traditional distinction between transport facilities (regulated) and enhanced services (unregulated) offered over those facilities should be shifted and the whole bundled package and all of the individual elements of the package should be unregulated.¹⁹ Incumbent providers argue that they have no incentive to invest in advanced networks if they must research, develop and install advanced facilities and then do not have the opportunity to realize the "full economic value" of the investment. In other words, the BOC's argue they will make less money on the new facilities if they must open them to use by their competitors at the same price the BOC pays itself for using those facilities to carry

¹⁸ Declaratory Ruling and Notice of Proposed Rulemaking, *In The Matter Of Inquiry Concerning High-Speed Access to the Internet Over Cable And Other Facilities*, 17 FCC Rcd. 4798

¶ 66 (rel. Mar. 15, 2002).

¹⁹ *Id.*, see also FCC Adopts New Rules For Network Unbundling Obligations Of Incumbent Local Phone Carriers, News Release, (rel. Feb. 20, 2003) (announcing adoption of an Order on Remand and Further Notice of Proposed Rulemaking in CC Docket No. 01-338, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers).

BOC-originated enhanced services. And the BOCs particularly object to that price being set on some basis related to “the cost of the investment plus a rate of return on the investment.” Under the BOC approach, whether there would continue to be a bare “transport” service on the most advanced elements of the network would be an open issue; if there were not, it is far from obvious that the competition which depends on using incumbent facilities could or would survive.²⁰ And if it does not, the question becomes – would government have to draw a different line in order to ensure that ICT is available cheaply and universally? The current debate in the U.S. may underline the importance of regulatory policies and systems that encourage and maintain open networks.

2. *What sort of competition should be encouraged; and what will encourage the most rapid deployment of advanced services?*

²⁰ As a related issue, U.S. regulation early on recognized that there was an enormous difference between *new entrants* to the market, and entrenched incumbent providers. The concept was to develop separate regulatory rules for dominant and for non-dominant providers. The latter would have resources and cash flow to comply with even a complex regulatory regime; new entrants, by contrast, might be unable to assume the same responsibilities as the incumbent. In addition, new entrants could not reach customers without sending some traffic over the dominant provider's network. Traditionally, the U.S. solution has been to regulate new providers lightly, while imposing much more substantial burdens on the incumbent to protect consumers and to allow competition to develop. The concern is and remains the fact that a dominant provider, facing no regulation, will use its control over essential facilities to drive other companies out of business.

The mode of regulation of incumbents has varied dramatically over time. Initially, incumbents were restricted to the signal transport business, a mode of regulation that limited incentives to improve the network or to make changes required to support advanced services. A second approach was to require “structural separation.” Under that model, an incumbent who wished to provide competitive services had to do so through a separate subsidiary, but the incumbent had to make its network available to others at the same rate and at the same terms and conditions that it made the network available to its subsidiary. The goal of this approach was to allow an efficient telecommunications provider to obtain additional profits by providing innovative services via the network (thus encouraging network investment), while preventing it from engaging in conduct that would discourage use of the network by others. We believe that this “separations” approach offered a number of advantages, but it, too, was ultimately abandoned. The key elements of the current approach are set out in Sections 251-2 and 254 of the Communications Act. “Structural” separation is no longer required. Instead, an incumbent must offer services in two forms. First, it must offer *common carrier services* at a stated price. Second, it must “unbundle” key elements of its network and offer those at a regulated leased price. The theory is that potential entrants can enter the market successfully by purchasing services from the incumbent, and reselling them, or by leasing facilities from the incumbent and using them more efficiently. But this model has proven incredibly difficult to implement because the technology and costs of particular “elements” of the network are nearly impossible to define.

Traditional U.S. policy has assumed that there would be a dominant facility that would provide services to consumers in a particular geographic market, and that a central task of regulation is to ensure that the facility remains open. As the foregoing noted, incumbents now complain that this policy discourages investment in new infrastructure, or to put it another way, the incumbent is more likely to build if it can squeeze all the potential economic returns out of the facilities installed.

Some U.S. policymakers find the incumbent argument attractive and argue that a central goal of U.S. policy should be to encourage development of competing broadband facilities. If one assumes multiple, broadband pipes are available to all and the relative investment costs of the different pipes are comparable, the problem of infrastructure access goes away. The incumbent can be allowed to control the flow of information over its facility because (at least in theory) a competitor or consumer could respond by switching to a different network. A pernicious permutation on this argument assumes that super-normal profits earned by the monopoly incumbents will send economic signals to the broader economy to develop these alternative pipes. This argument approves monopoly profits as a social good, creating incentives for technology changes. By increasing the profit available to the incumbent (the argument goes), the incumbent will invest; by limiting access to the incumbent's network, companies dependent on that network will themselves be forced to invest in competing facilities to survive.

There are very few people who actually believe that there are multiple, broadband pipes widely available in the United States now, or that alternative pipes will be available to all in the United States at any time in the near future. But, many policymakers believe that (a) there is enough potential for competition; and (b) that encouraging deployment is so important that the incumbents' approach should be adopted. Supporters of this approach believe encouraging deployment will have the same economic development effect in the United States as did the original spread of the Internet in the '90s. They argue something must be done because the U.S. ranks 11th among industrialized nations in distribution of broadband facilities, with only about ten per cent of all households having broadband access.²¹

The authors think the opponents have the better position. As the opponents point out, super-normal economic returns do induce additional competitors to enter *competitive* markets. However, if there are significant barriers to entry to the market, no level of super profits will induce new entrants to achieve the impossible. And the income transfers from the consuming public to the monopoly carrier deprives the broader society of the economic benefits of those resources being used elsewhere in the economy. In other words, concentrating market power in the hands of a few will not encourage the networking required to stimulate growth. The true lesson of the 90's is that economic growth occurred in part *because* networks were open.

The debate over open versus closed networks is likely to be a worldwide debate, with significant implications for the development of the Internet. It also illustrates an important and oft-repeated regulatory issue. An incumbent will argue that it must be provided regulatory relief in order to have the *incentive* to invest, while refusing to guarantee that it will invest the super-normal profits back into enhanced facilities. The sort of regulatory relief sought by incumbents in the

²¹ <http://www.itu.int/ITU-D/ict/statistics>

U.S. could limit or destroy competition now existing over the incumbents' systems without any increase in the speed or amount of advanced network deployment in the United States.

Words are easy. Performance is what matters in network deployment and service enhancement. At the turn of the century in the United States (when telephone regulation occurred primarily at the local level) a company's rights were defined by a form of social contract – a franchise. The franchise described what the company had to do in order to secure its rights to operate. The question facing the FCC, and ultimately any regulator, is first, what guarantees are rightly demanded as part of the "social contract" underlying the regulatory scheme? The related question: is it really in the public interest to grant the benefit demanded by the utility?²² In some respects the demand for protections from competition implicit in the U.S. debate assume that (a) bottleneck infrastructure should be provided by the private sector; and (b) it should be provided from the top down, by centralized utilities, rather than by collections of users who provide connections to the utility's central infrastructure. As Part III suggests, there may be significant opportunities for extending networks outside the utility paradigm, and in a pro-competitive manner.

3. How should universal service be encouraged in a competitive marketplace?

Where a defined and limited service is provided by a monopoly provider, or a set of monopoly providers, it is much simpler to structure rates and service obligations to support universal service. The cost of extending service to rural or remote areas can be collected through cross-subsidies – rates which permit the service provider to charge more to customers who are relatively cheaper to serve, but for whom telecommunications services have the highest value. This was one of the central elements of the structure used to extend basic telephone service to rural areas in the U.S.

In a competitive, multi-product market, this system no longer works. In competitive markets, prices are driven down. The ability to cross-subsidize disappears. In addition, services begin to fracture: rather than providing a relatively uniform set of services, increasingly distinct services are offered by service providers. In this environment, ensuring that all of the new services are available universally, at affordable rates, becomes a significant challenge.

The U.S. approach to universal service is prescribed by Sections 214 and 254 of the Telecommunications Act. Under the U.S. approach, every provider of telecommunications services is required to pay a fee into a universal service fund. The fund is then used to pay part of the costs incurred by eligible telecommunications providers to extend lines to remote areas, and to provide low-cost telecommunications service to schools and libraries. Essentially, all competing companies pay these "providers of last resort" to provide universal service.

²² This issue is well understood in developing nations. Often foreign corporations offer to assume the national telephone company only on the condition of receiving an exclusive right to provide services via telecommunications facilities. These investors argue that this "exclusivity" period encourages and speeds up investment, although some analysts have questioned whether the costs outweigh the benefits, *see* Wallsten, *supra*.

The basic principle underlying the universal service provisions of U.S. law are quite broad. Section 254 provides, for example:

Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.

But Section 254 goes on to define what services should be provided universally in far narrower terms:

Universal service is an evolving level of telecommunications services that the [FCC] shall establish periodically under this section, taking into account advances in telecommunications and information technologies and services. The Joint Board in recommending, and the Commission in establishing, the definition of the services that are supported by Federal universal service support mechanisms shall consider the extent to which such telecommunications services--

- (A) are essential to education, public health, or public safety;
- (B) *have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers;*
- (C) are being deployed in public telecommunications networks by telecommunications carriers; and
- (D) are consistent with the public interest, convenience, and necessity.

(emphasis supplied). In other words, the Section 214/254 universal service mechanisms as adopted are subject to some significant limitations, and are not well-designed to support construction of facilities necessary to provide advanced communications and information services (the sort of services which fall outside the definition of telecommunications service under U.S. law). Likewise, the persons subsidized are telecommunications carriers – the providers of traditional, common carrier services.

If the goal is to provide for rapid roll-out of advanced services, additional mechanisms may be required. The federal government provides grants for various telecommunications development projects in rural areas, but the scope and size of the available grants is limited. Another, more aggressive approach would be to expand the universal service requirement to require all providers of regulated communications services, whether broadcasters, cable operators or traditional telecommunications service providers, to contribute to a fund that could be used to establish community media centers. These centers could be connected to the Internet and to other local communications networks, and could provide a central location where a person could obtain information, or create information. As suggested above in the U.S., Title VI gives local government some authority to require cable operators to provide and support such centers, but

other highly profitable communications providers (such as broadcasters) provide no comparable support. What is the ground for requiring such support? The rationale is a simple one: in the U.S. cable operators, broadcasters and others are given rights to use valuable public resources (whether the airwaves, streets or other public property) for private gain. If one is pursuing a market-driven, deregulatory environment, it is fair to ask these providers to pay a fair value for resources used. Those funds could then be used to support broader and more advanced universal services.

PART III. Telecommunications and Economic Development Outside the Traditional Utility Model.

At this stage, well-designed regulation is essential to a strong, competitive telecommunications system. But even the best regulatory system has limits, and for many communities in the U.S. and elsewhere, existing models simply do not yield adequate results. As a result many communities are beginning to look outside the traditional utility models for different ways to provide their businesses and residents with opportunities to participate in the information age. This section briefly examines some of the ways in which those opportunities are being created. We believe that these efforts suggest that government must regulate the monopoly aspects of the communications industry and maintain open networks, but should also stimulate exploration of alternatives to the local monopoly...and specifically must look for solutions where even the local monopoly under regulation is unable to address a market failure caused by excessive cost of the monopoly technology, or an unmet social need which the existing technology will not address. That is, the best national policies will include development incentives to non-traditional market players as well as regulatory restraints on excessive monopoly power.

A. The Island of Niue.

We begin outside the U.S. and closer to Sydney, on the island nation of Niue. Niue is part of the Cook Island chain, and a former territory of New Zealand. It has a land mass of roughly 260 sq. km., and has a population of about 1,800 people. The island is served by a monopoly, state-run utility, hardly a surprise given the size of the island. But beginning in June of this year, a private, non-governmental organization called the Internet Users Society – Niue (IUSN) began providing free, wireless Internet access to all residents and visitors to the island.

The service is provided using a relatively new technology that uses short-range, low-power devices operating in unlicensed frequencies (in the U.S. the devices share frequencies often used by cordless telephones). The technology, colloquially known as "Wi-fi"²³ is exceptionally cheap. It involves a "gateway" device that is attached to an Internet connection either directly or through another wireless connection, and a compatible device attached to a computer. Any computer with a compatible card can communicate with any unsecured "gateway" within its range. A consumer grade card and gateway can be purchased for about \$125 US. While the

²³ There are several varieties of "Wi-fi" technology. Each variety has different speed and security characteristics. What are technically referred to as 802.11.a, b and g technologies are all often treated as "Wi-fi" systems, for example. In this paper, we ignore the technical differences between these different flavours of Wi-fi.

range of the devices is not great, one device could allow several homes in a neighborhood to share a single Internet connection at relatively high speeds. By linking several devices using wireless or wireline devices, one can create provide access wirelessly much more cheaply and quickly than one could provide access using wireline technologies.

How does the IUSN provide free service? Niue, like every nation, has sovereign control over the a country code top-level domain (ccTLD). In the case of Niue, that top level domain is .nu, the Niue equivalent of the infamous .com. Domain names form part of the basic structure of the Internet, and licensing names is a big business. Niue authorized IUSN to market the .nu domain name (our firm, for example, could license the name millervaneaton.nu instead of the domain name we do license, millervaneaton.com), and it has done so vigorously. The IUSN newsletter claims about \$140,000 subscribers, at \$80 for a 2-year license. The money collected was used to build the wireless network and provide the free wireless service. IUSN also constructed an Internet Café in the island's largest city to serve residents who did not have their own computers.

The wireless service provides access to the Internet that cannot be provided using the state-owned telephone systems landlines. Many of those lines were (until relatively recently) so old that they could not support data communications. IUSN reports that its service is critical to the welfare of the community. Most Niueans do not live on the island, but instead emigrate to seek employment opportunities abroad. Communication between family members on and off island is very expensive using traditional communications networks (about \$1.08 per minute U.S. to call New Zealand, according to IUSN). By using the Internet, families are able to communicate online at no charge. That does not mean the network can avoid more traditional communications network. The system gets to the Internet via a satellite connection, and in New Zealand uses a telecommunications lines to connect to the Internet. What Niue suggests is that, as long as critical backbone networks are in place and available, even a small community may be able to develop telecommunications capabilities by leveraging its assets.

B. The Confederated Tribes of Warm Springs, Oregon

In the U.S. West, American Indian tribes often have sovereign control over large, rural tracts of land. The reservation of the Confederated Tribes of Warm Springs covers approximately 640,000 square acres (about ten times the size of the island of Niue), has 3300 residents (2400 in the largest community), and like many American Indian reservations does not have adequate, advanced communications networks.

The tribes' solution is to construct their own Internet-focused communications system. Initial system construction and operation is funded by a roughly \$700,000 grant from the Rural Utilities Service (RUS) to the Confederated Tribes. The funding will enable the tribe to bring broadband telecommunications access onto the reservation via a microwave link from a telecommunications backbone connection in Madras, Oregon. Once on tribal land, the broadband signal will be distributed via fiber optic cable to key tribal agencies. Broadband Internet access will also be made available to tribal residents and businesses via either a fiber optics cable or wireless connections. The connections should enable the Confederated Tribes to implement distance learning, telemedicine, enhanced public safety, tele-work opportunities, community television

via web-casts, and economic development projects requiring broadband, and e-government applications. The system is expected to roll-out early in 2004.

A key element of the project is the creation of a Telecommunications Community Center. The Center will house 24 desktop computer stations connected to high speed Internet. The Center will be open 7 days a week and will be free of charge to the community for the first 2 years of operation. It will cost approximately \$100,000 to build, \$60,000 to equip with computers and \$90,000 to staff. The grant from the RUS covers the first two years of operation. The unanswered question is whether the service can begin to pay for itself after that point through a combination of subscriptions, additional grants or other revenue-raising measures.

Critical to the success of this project is an open, affordable backbone connection to the Internet; the network does not completely bypass traditional telecommunications infrastructure. But it does illustrate how a community may be able to improve communications infrastructure in a relatively short period of time through Internet-focused solutions.

C. The City of Tallahassee, Florida.

The City of Tallahassee, Florida has long owned its own municipal electric utility. It is served by a variety of private communications companies as well, including the a subsidiary of the U.S.' largest cable company. In an effort to stimulate the development of advanced communications technology and applications that would benefit the economy in Tallahassee, the City become a partner in a community-based initiative to support and encourage the expansion of a Wi-fi network called "Digital Canopy." The initial network deployment was done with 27 partners, including State and local government, private vendors, universities, associations and local information technology, and covered the City's central downtown area. In the demonstration phase, any City resident could obtain free wireless access to the Internet in the downtown area. The project was designed to determine just how popular a Wi-fi service would be, and whether it could pay for itself.

The City is now planning to expand the network to address three key user objectives:

(i) improving the mobility and efficiency of City employees through mobile workforce functionality; (ii) helping solve the challenge of the Digital Divide by building a "smart community"; and (iii) generating revenues through wholesale provision of services to local ISPs and service providers. That is, the City network can provide the part of the physical platform required to provide competitive services, enabling potential competitors to bypass roadblocks created by the dominant service providers.²⁴

Tallahassee is one of several U.S. cities seeking to wireless technologies to enhance economic development opportunities. The City of Long Beach, California has rolled out free wireless Internet service in its downtown area supported in part by equipment donations from local companies, with the cost of the Internet connection itself (about \$2,500 annually) being paid for by the City. When a user logs on to the network, a special screen appears providing access to information about community events and local businesses and organizations. The City plans to

²⁴ <http://talgov.com/citytlh/utilities/ubcs/canopy.html>

expand the network to reach the local airport, making it easier for business people to obtain free connections via the Internet to their home offices, and thereby (the City hopes) making Long Beach a more attractive destination airport for business travelers.²⁵ In other words, the City is creating a system that functions more like an economic public good. The stated goal is less to make the system itself profitable than to make the community as a whole profitable, by providing a visitor the electronic equivalent of a printed community guide, combined with the networking power of the Internet.

New York City is also investigating municipal-based development of a communications network, albeit from a slightly different perspective. New York is the largest municipal purchaser of telecommunications services in the U.S., and has traditionally purchased most of its services from the incumbent private telephone service provider in New York City. The City also owns fiber optic lines that it has installed for its own purposes, but whose capacity is not fully utilized. Finally, it owns property (rooftops, towers and the like) that can be used for placement of telecommunications facilities. In May, a City Council report recommended that the City coordinate use of these assets to encourage communications development. For example (as the report notes) the City could use its buying power to provide a market entrant with a stable sources of revenue; could lease fiber to make it easier to roll-out new services; and could lease real estate at preferential profits to encourage the roll-out of free wireless services throughout the City.²⁶ The New York effort would build upon what is already a widespread private effort to create wireless, Wi-Fi networks throughout the City.²⁷

None of the efforts described above are a replacement for the key common carrier facilities required to deliver the full ambit of telecommunications services. But, the networks all provide an important locally-based alternative for rolling out advanced telecommunications based on leveraging the assets available to a community. Governmental policies that encourage localities to identify assets, and then utilize those assets creatively to create new communications networks based on the Internet may help close the digital divides now facing us.

²⁵ http://www.longbeachportals.com/wireless/downtown/about_us.htm

²⁶ The report appears at <http://www.muniwireless.com/reports/docs/NYbroadbandcity.pdf>. It proposes that the following principles guide creation of new networks to serve New York City:

- The City's procurement of telecom services should be fully open to rigorous competition;
- Given the effect that telecom spending can have on the wider socio-economic fabric of cities, substantial community involvement should guide the municipal telecom procurement process;
- Excess fiber capacity built as a consequence of City funding should be open to third parties at competitive wholesale rates;
- And finally, preferential rates for municipal rooftops and fiber access should be set for community networking initiatives.

"Networking NYC: Building the Broadband City," May 2003.

²⁷ <http://news.bbc.co.uk/1/hi/technology/2288339.stm>