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September 8, 2000

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Margalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, SW— 20554

Re: America Online, Inc. and Time Warner, Inc.
Notice of ex Parte Presentation
Application of American Online, Inc. and Time Warner, Inc.
For Transfers of Control, CS Docket No. 00-30. ✓

Dear Ms. Salas:

On behalf of the Center for Media Education (CME) I submit herewith pursuant to Commission rules an original and one copy of this notice regarded a permitted oral ex parte presentation in the above mentioned proceeding. Yesterday, I met with Royce Dickens, Nancy Stevenson, Carl Kandutsch, and Darryl Cooper from the Cable Services Bureau. James Baird and Joel Rabinovitz from OGC also attended. I discussed CME's positions about the proceeding as detailed in our April 26, 2000 filing (Petition to Deny of Consumers Union, et al). I also discussed in general terms trends with the cable industry as it relates to broadband and interactive television.

I presented the FCC staff present with a number of documents, including transcripts from the NCTA annual convention where the building of a "walled garden" was discussed, as well as the cable industry's creation of next-generation platforms for MSO branding purposes; a series of "White Papers" and other materials prepared for the cable industry by the Cisco Corporation; press clippings and press releases on set-top box operating system software relationships of AOL, Time Warner. and AT&T; and SEC filings of Liberty Media, Inc.

I summarized CME's concerns about the threats to the diversity and openness of the broadband Internet as a result of this proposed merger, as reflected in our Petition.

Sincerely,



Jeffrey A. Chester, Executive Director

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Scott C. Cleland

January 24, 2000

Preview of Portland Open Access Appeal Decision – A Landmark Case?

Summary: Cable and broadband investors need to remain alert to the pending Ninth Circuit Court of Appeals decision of the Portland vs. AT&T decision, which ruled that localities have the regulatory authority to require cable operators to open their cable plant to competing Internet service providers (ISP). A decision could happen **any week now**, given that the court granted an expedited appeal and it has been nearly three months since the oral argument. TPG previews the likelihood and implications of the various possible decision scenarios to help investors prepare for probably the most important pending court decision to the future of cable broadband communications. Since the FCC has not made any *legally binding* decisions on cable access, we believe it seems the FCC effectively has abdicated leadership to this court to **set the regulatory trajectory for any cable broadband regulation going forward**. Consequently, this Ninth Circuit court decision could be more of a surprise and more of an inflection point than many appreciate.

Analyzing the Decision Tree of Possible Outcomes: The "decision tree" of the court is likely to be as follows: the court must first address the regulatory definition of the underlying cable broadband service. Is it (1) a "cable service" as the lower court, Portland and AT&T all argue or (2) a "telecom service" as the FCC suggested in its friend-of-the-court brief, and as two of the three judges apparently suggested in their repeated questions at the November 1 oral argument? If it is a "cable service," the court then has to decide if (A) localities have the authority to require open access or (B) they do not. If the court decides the underlying service is a "telecom service," the court may then decide which jurisdictions have regulatory authority. TPG analyzes the various scenarios below.

45%: Ruled "cable service" + court upholds local authority. Prior to the oral argument, TPG considered this the most likely outcome, because neither the lower court, Portland nor AT&T contested the regulatory definition. If Portland is upheld, that would trigger roughly a dozen more cities to automatically mandate open access, roughly doubling the current number. If Portland's authority is upheld, that would be a **positive development for ISPs seeking access to cable customers; a negative for @Home, AT&T, Time Warner, and the rest of the cable industry; and a neutral for AOL**, which precariously straddles this issue with its pending merger with Time Warner.

25%: Ruled "cable service" + court overturns local authority. In this scenario, AT&T, @Home, and the rest of the cable industry would be very big winners, because they would shut down the grass roots political forum in which open access has the most momentum. This scenario would be a **major setback for ISPs**, especially smaller ISPs, because they will not have enough "market force" to gain cable access by themselves. Once again, it would be a **neutral for AOL's straddle position**. Caveat: AT&T could also win if the court "threads the needle" by ruling

that cable broadband is an unregulated "telecom facility" used to provide an unregulated "information service" (as opposed to a regulated "telecom service"), used in the provision of @Home's unregulated Internet service.

30%: Ruled "telecom service" or sent back to FCC to decide? Since the surprise focus at the oral argument was about whether the underlying service is actually a "telecom service," this is the **major variable scenario** with potentially more **profound investment implications** than most appreciate, in our opinion. The court could either rule cable broadband is a "telecom service" itself or it could order either the FCC or the lower court to decide conclusively if it is a "telecom service" or not. Given that this court agreed to an expedited appeal this could suggest that this court will decide it itself. If the court rules cable broadband, a "telecom service," **AT&T would win the battle against local regulatory authorities while likely losing the war of open access**. This scenario would be a **very big positive for ISPs** seeking access to cable customers because common carrier law and regulatory/legal precedents strongly support mandatory open access, interconnection, and interoperability. **It would be a very big negative for @Home, AT&T, Time Warner, and the rest of the cable industry**. Cable's worst regulatory nightmare has been the possibility of common carrier regulation because it would eviscerate their broadband business model, which rests upon being able to exclusively leverage products and content vertically in an end-to-end closed network system. This scenario could be **negative for AOL** if the market valued cable (and Time Warner) differently as a potential broadband *common carrier*.

Broad Ramifications if Court Rules it a "telecom service":

(1) **Action-forcing event?** The FCC would have a new legal mandate to enforce and/or new process deadlines to meet. (2) **Flip the legal burden of proof?** Currently the ISPs have the legal burden to prove they warrant open access. If ruled a "telecom service," cable would have the legal burden to prove why they should be exempt from standard "common carrier" obligations of access, interconnection, resale, and interoperability. (3) **State regulators back in game?** Competitive telecom carriers that would want to serve ISPs could file for mandatory interconnection to cable and, under the law, state regulators would arbitrate differences over the terms. Even though the FCC has ruled advanced services to be solely under federal authority, it has kept the states involved in implementation. (4) **Common Carrier Bureau oversight?** Broadband regulatory oversight could shift from the currently cable-hospitable Cable Bureau to the Common Carrier Bureau, which has proven to be zealously pro-competition and pro-open networks. (5) **More open interoperability standards process?** Common carriers have much greater legal obligations and a more rigorous standards process than cable to make their equipment and protocols interoperable with potential out-of-industry competitors. * * * *

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Scott C. Cleland
 January 21, 2000

Investment Ripple Effects of AOL-Time Warner Merger

Summary: A merger like AOL-Time Warner can cause major investment ripple effects. **TPG believes the AOL-Time Warner deal may crimp or delay AT&T's national ambitions to be the cable industry's broadband network provider, and may make it harder for AT&T to retain an ownership interest in Time Warner when closing the MediaOne merger. The AOL-TimeWarner merger also may create a major fork in the road for cable broadband competition and the open access issue.**

Implications for AT&T-MediaOne and Cable Industry?

(1) Limits/delays AT&T's national broadband reach?

Many may not appreciate that this merger has the possibility of crimping AT&T's national ambitions to quickly become the cable industry's end-to-end broadband network provider. AOL brings to Time Warner a proven and long-standing backbone network relationship with MCIWorldCom (AOL is UUNet's largest customer). TPG suggests that the addition of AOL to this "mix" could complicate and further delay Time Warner's completion of a highly strategic, long-term broadband deal with AT&T. While a broadband telephony deal has been "ripe" from AT&T's perspective for almost a year, it looks as if it may not "ripen" for Time Warner anytime soon. AT&T has a much earlier time deadline in closing MediaOne than does Time Warner with AOL. And Time Warner probably does not want to commit AOL to any fundamental long-term strategic broadband arrangements prior to the merger's closing.

(2) Complicates closing of AT&T-MediaOne with all assets intact?

While TPG expects the government to approve the AT&T-MediaOne merger, TPG now suspects **AT&T may not be able to retain MediaOne's 25% ownership stake in Time Warner Entertainment (TWE).** AT&T still hopes to successfully exploit a narrow FCC ownership loophole that would allow it to exceed the FCC's 30% national cable ownership limit and keep a "broadband" ownership interest in #2 Time Warner, if it can completely insulate AT&T's interest in Time Warner's programming. However, TPG believes the **AOL-Time Warner deal may alter the prior assumed "broadband" equation significantly more than most appreciate.** The AT&T-MediaOne merger would give AT&T substantial ownership influence over the only two national cable Internet access providers: @Home and Road Runner. Time Warner's Road Runner gains a golden opportunity to convert AOL's majority market share of narrowed Internet access to broadband. TPG suspects the government would prefer that AT&T and Time Warner develop into national broadband competitors, rather than merging de facto through cross-ownership and reciprocal arrangements trading AOL Internet access to AT&T plant for AT&T telephony on Time Warner plant. Moreover, prior to the AOL-Time Warner

merger, AT&T-Time Warner broadband negotiations did not potentially involve AOL's half of the Internet access market and AOL's alliance with the other half of the long-distance industry (MCIWorldCom/(Sprint?)). That is a significant new competitive development for the AT&T-MediaOne merger. In short, **the AOL-Time Warner merger may complicate the AT&T-MediaOne closing more than the companies are acknowledging.**

A Fork in the Road: Open or Oligopoly Access?

A big question everyone is asking is what this AOL-Time Warner deal means for open access. (1) If AT&T and AOL-Time Warner increasingly evolve into competitors and not broadband collaborators, "market forces" in this scenario should produce relatively more open cable networks over time. As competitors, both AT&T and AOL-Time Warner would have to depend relatively much more on alternative broadband facilities outside their respective regions (DSL and fixed wireless access) than expected, to fulfill their national reach ambitions. (2) However, if AT&T and AOL-Time Warner choose to be cross-owned collaborators reciprocally trading AOL Internet access to AT&T for AT&T telephony access to Time Warner (as many investors think), "market forces" would likely yield less open access and more favorable access terms to cable. In this cable-favorable scenario, the cable industry could contain the potential competitive damage of open access by providing "consumer choice" among jointly owned cable-brands of ISPs — in other words, **safe "oligopoly access" competition among "friends" in the cable "club."** This scenario is how cable plans to "thread the needle," allowing consumers "a choice" of ISPs while preventing regulation and avoiding much access competition. (3) **These divergent scenarios mark a fork in the road that investors need to watch.** We have seen this type of situation at least twice before — yielding different outcomes. In the 1980s, the cable industry successfully collaborated and prevented pay programming services (HBO, Showtime, etc.) from being a competitive threat to core cable programming by ensuring that the major cable operators jointly owned these pay services — access for ownership. That way all of cable benefited. In 1997, however, cable tried to hedge the effects of DBS competition by trying to cross-own one of its DBS competitors — PrimeStar. That time, the Justice Department disallowed the cross-ownership as anticompetitive. **Investors should watch the AOL-Time Warner and AT&T relationship very closely to see which way these powerful "market forces" attempt to drive the marketplace. We believe that will be a key precursor to how competitive the world of convergence will be and how "open" cable open access turns out to be.**

* * * *

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Scott C. Cleland

January 7, 2000

Investment Implications of FCC's Policy Shift on Cable Open Access

Summary: In the holiday rush last month, many investors may have missed a couple of very significant developments in the federal government's policy toward cable open access. While the federal government remains very reluctant to regulate cable open access proactively at this time, what is new as of December is a clear official indication from the government that it expects cable eventually to open its currently closed network model. The take-away for investors is that the endgame of cable open access has become much clearer, even if the transition path to get there remains as cloudy as ever. Moreover, while the government and cable agree that a "market forces" solution is better than a regulatory solution, the government and cable profoundly disagree on what network architecture best serves consumers — government supports open networks, while cable supports a proprietary closed network. **What this means practically for investors is that some of the much-talked-about "market forces" will be regulators pressuring cable behind-the-scenes to negotiate open access under the not-so-subtle threat that regulators will compel open access eventually, if cable does not cooperate with "market forces."** Investors should not be surprised to see additional "government-encouraged" or "market forces" talks/agreements comparable to the December AT&T-MindSpring open access "agreement in principle." The government-cable disagreement over network architecture remains very *investment-relevant* because **cable's current broadband business model numbers probably don't work in the expected timeframe without closed network assumptions.** The investment unknown is if and when cable adjusts investor expectations to reflect the government's desired open network endgame.

Two Very Significant Developments in Government Policy:

(1) In December, the Clinton/Gore Administration ended its long silence and endorsed the principle of cable open access in its annual e-commerce report: The administration "supports the principle that consumers should have choice in both their content and their Internet Access Provider." (2) FCC Chairman Kennard, in a December 16 speech before the cable industry, very pointedly warned cable that it faced a "Boston Tea Party"-type consumer revolt if it did not proactively agree to provide more open access to their facilities. **After months of the FCC's saying it did not even know what "cable open access" was, FCC Chairman Kennard has now defined it quite specifically for the first time: "...everyone better understand what openness means for the consumer. And how the marketplace must deliver it. ...By open protocols, I mean that**

the interface standards that applications developers and equipment designers use are arrived at in an open transparent process, and then made accessible to everyone just like the IP protocol. By open boundaries, I mean that interconnection is encouraged, and bottlenecks and content control are eliminated. The borders are porous, not closed or walled off, and outside programming and services are allowed to enter the network and interact freely with consumers. By open prices, I mean that prices for access to the network are determined by a competitive market, not unilaterally by a rate setter, whether public or private. And the customer can reach the service provider of their choice without having to pay twice." Investors should note that this is: (1) a very significant new policy shift from the FCC and (2) very different from the cable industry's closed-network position.

The Different Investment Dimensions of Open Access:

(1) Top-Down Investment Dimension: To date, the market has focused almost exclusively on just the macro investment question: does the government regulate open access or not? This question has dominated the debate for several reasons. (A) "Regulation" and the threat of it affect the industry's perceived growth rate and, hence, the "psychology" of cable's stock valuation. (B) The regulatory outlook affects cable's range of financing options, effectively raising cable's cost of capital. This is very significant, given the capital-intensive nature of transforming cable plant into broadband. (C) And the cable industry has framed its opposition to regulation in investment terms — that open access regulation would drastically reduce their financial incentive for rapidly deploying broadband cable modems. **(2) Bottom-Up Investment Dimension.** However, now that the government officially has indicated its desire for an open cable network in the end, the market needs to tune into the question that matters most to cable's bottom-up business fundamentals: will the cable network be open or closed? An open network, in our view, would mean: (A) a **new pricing trend** from high-margin retail prices to lower-margin wholesale prices; (B) a weakening of cable's bundling leverage and its ability to cross-subsidize, **increasing customer acquisition and retention costs;** (C) a **lessening of cable's control of the customer relationship,** threatening customer loss in the base that most assume is safe from competition; (D) increased competition in the core video programming business from streaming video; and (E) an **undermining of cable's ability to negotiate a premium fee for exclusive e-commerce relationships.** * * * * *

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Scott C. Cleland

December 9, 1999

Cable's Ignored Future – How Technology Promotes Competition to Cable

Summary: TPG believes that **long term, the traditional core cable business model is under much more pressure than the market appreciates.** To date, the market has selectively factored in only how technology creates upside for cable in new businesses, and has all but ignored the downside of how the exact same technology could undercut the core cable business by accelerating competition and by eroding cable's current ability to leverage its video market power into vertical broadband markets. **The market's assumption that the core cable business faces little competitive risk is off-base.** Technology is a two-edged sword that cuts both up *and* down. (This piece builds on our 4-19-99 piece, "Is the Internet Cable's Friend or Foe Long Term?")

How Technology Undermines the Core Cable Business:

Technology, other than well-known DBS technology, could change the core cable business model profoundly in ways that the cable industry cannot control long term. (1) **Technology is transforming cable from a network of scarce channel capacity to a network of abundant wholesale capacity.** Previously, channel capacity limitations were a barrier to competition and increased consumer choice; now, capacity-increasing technology is an enabler of increased competition and consumer choice. Just as microwave and fiber technology advances enabled long-distance and local phone competition by creating new *wholesale* markets, now broadband and Internet technology enable more video distribution competition by creating the potential for a new *wholesale* broadband market. Over time, technology will **migrate cable toward a lower-margin wholesale business** from the current near-monopoly, high-margin retail business. (2) **Internet and computer technology is a powerful decentralizing force.** Computing power is shifting relatively from central head-end control to the end-user control on the set-top box or computer. This undermines current supplier control of video programming and packaging, and strengthens the hand of the consumer and competing video programmers — over time. Much of the traditional core cable model (i.e., consolidation and vertical leverage of distribution and content) **centralizes** control of video programming distribution or, in economic terms, maintains "artificial scarcity." (3) **The same broadband technology that enables cable to "bundle" new broadband services also enables its "unbundling."** Contrary to cable rhetoric, broadband Internet technology makes it much easier technically to decouple "last-mile" distribution from content and enhanced services. Digital packets obviously are much more easily rerouted than rerouting continuous analog signals. Thus, this technology directly assaults the source of cable's market power that analog technology previously reinforced — the ability to enhance the value of content/enhanced services through

"gatekeeper" ownership of the scarce conduit. A resulting trend could be for content/applications increasingly to become "free agents," whose destiny is not controlled by cable operators (e.g., John Malone's shift of wealth toward Liberty's *content*). (4) **Digital cable technology enables much more competition than analog cable technologies.** Digital TV over an open Internet "end-to-end" cable architecture would create the potential for intervening competition for all services in a cable bundle — "atomistic" competition as the Justice Department calls it. "Atomistic" competition gives consumers more choice and, more importantly politically, allows consumers the freedom not to have to pay for programming they do not want to watch or support financially. (5) **New gigabyte-storage set-top box technology** further undermines cable's technological control over programming by giving consumers the technology to much more conveniently become their own programmers — i.e., "time-shifting." (6) **Technology change presages regulatory change.** To date, technology has been the predicate of how a service is regulated or not regulated. Technology has enabled the cable industry to reengineer its one-way (broadcast) cable plant into a two-way (telecom) broadband plant. **The implication is that current cable regulation is based on an increasingly outdated technological predicate, because, if past is prologue, big changes in cable's regulatory status are on the horizon.**

Cable's Current Regulation: "As Good As it Gets?" As TPG has maintained for some time, cable's long term prospects hinge largely on whether it has an open or closed network or whether technology can increase competition to cable. TPG continues to believe strongly that **the market does not appreciate the extent to which cable's core investment assumption of a closed network rests on any of three fragile regulatory assumptions.**

(1) Regulators will never consider two-way broadband service over cable plant to be a type of *telecom* network. (2) Antitrust officials or a court will never define broadband as a *separate market* from narrowband Internet access — a key legal ingredient of finding "anticompetitive tying." (3) The current regulatory "ends" of local telecom competition and broadband deployment always will "justify the means" of affording cable preferential regulatory treatment relative to other broadband technologies. Investors need to appreciate that technology is no longer a barrier to broadband competition. **The biggest remaining barriers to broadband competition and innovation are government policies protecting cable market power from Internet competitors:** i.e., a closed broadband network architecture with no interconnection or resale, no Internet leased access, and no compulsory copyright license for "Webcasters" to gain competitive access to content like cable and DBS already enjoy.

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Scott C. Cleland

December 6, 1999

AT&T-MindSpring: Sliding Faster Down the Slippery Slope to Open Access

Summary: Investors should not miss the significance of the recent AT&T-MindSpring cable access "agreement in principle," which informally commits AT&T to allow its customers "a choice of ISPs...without having to subscribe to any other ISP," i.e. Excite@Home. This is a significant development because this is the first time AT&T has conceded publicly to the FCC that consumers will not have to buy @Home to get cable high-speed service. Simply, AT&T has committed in principle to become a wholesaler of cable high-speed access. At least for AT&T, cable open access is now not a matter of if, but when, how, with whom, and on what terms. Contrary to the conventional wisdom that this agreement takes "the wind out of the sails" of open access, the exact opposite is closer to reality — this agreement is more aptly described as "blood in the water." **Investors need to appreciate that this issue is not fading away; it's heating up because the rest of the cable industry is not on board.** The combination of the MindSpring deal and AT&T's new commitment to offer open access on its fixed wireless platform signals that **at least AT&T is sliding faster down the "slippery slope" towards full-blown cable open access.**

What's Really Going On? (1) Overall, the AT&T-MindSpring agreement in principle represents significant, but modest progress toward open access. Essentially, the agreement represents very selective access to AT&T's cable plant. In brief, the two-page letter of agreement: (a) is **non-binding**, (b) **does not apply until July 2002**, (c) is not enforceable, (d) sets no wholesale price, (e) sets no guidelines or guarantees on bandwidth or performance, (f) does not afford an ISP full control of its relationship with the customer, and (g) does not address operational support systems and bandwidth performance measures for competitive ISPs. The agreement covers MindSpring, the #2 ISP (of 6,000 ISPs) with roughly 5% share, and AT&T, which covers about one-fourth of cable customers. The proposed agreement would resolve the easiest parts of the negotiation; however, it does not resolve the most important, investment relevant, and hardest parts of the negotiation: price, bandwidth, and customer control. (2) For AT&T, this is a "political tourniquet" to try and staunch the political hemorrhage for open access — essentially the best reaction to a bad situation. It could have the added benefit of delaying regulatory intervention, providing AT&T valuable time to lock up as many customers as possible while still enjoying "first-mover" advantage. AT&T also hopes the agreement reduces its antitrust risk/liability, and keeps the Justice Department Antitrust Division and the FCC at bay on the AT&T-MediaOne merger. (This agreement could be a

precursor that regulators are more concerned than they are letting on publicly.) (3) **The rest of the cable industry** can probably be fairly described as "freaking out" about the agreement and how it drags them in a direction they are loath to go. While AT&T may hope this agreement will divide and conquer the ISPs, the agreement could easily backfire and further fracture the increasingly "balkanized" cable industry. (4) For MindSpring, this provides a strategic "foot in the door," to pry the door open further over time. MindSpring won a major concession — AT&T committing formally to wholesale high-speed cable access; now it is only a negotiation about price, terms, and bandwidth — the tough issues. (5) For the ongoing debate, this event is probably "blood in the water." It likely will not calm the water's inhabitants, but agitate them. Counterintuitively, this event probably will accelerate the resolution of this debate, not slow it down, as many expect.

The Sides Are Still Very Far Apart: What is "open access"? "Access" is the unfettered freedom to compete and win control of the customer relationship; "open access" is when **anyone** has the unfettered freedom to compete and win control of the customer relationship. Until this agreement, cable's definition of access was a form of "icon access" whereby cable would agree not to keep some competing icons off their first screen. This agreement takes open access a good bit further, by allowing consumers choice of their ISP. However, what the bulk of open access proponents want is the mitigation of cable's ability to anticompetitively leverage its market power in the video distribution business into the broadband market. These open access proponents want facility access at a wholesale rate to be able to offer **whatever** bundle of services they can sell a customer — **complete freedom to use the spectrum in any way they see fit, including offering competing video programming packages, local/long distance telephony, and any other broadband service or content they could sell the customer — much like the way in which competitors can use the wholesale telco pipe.** This facility access would enable a competitor to control the customer relationship, i.e., the primary billing relationship and control of the "first screen" or navigation menu. AT&T and the cable industry's whole broadband business model is predicated on being the exclusive provider of the cable "bundle" of broadband services. **Without the cross-subsidy of multiple leveraged revenue streams of telephony, high-speed access, digital TV, basic cable, and interactive e-commerce, cable's numbers either do not work at realistic penetration levels or produce much more modest margins.**

* * * *

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Devaluing the Internet: "Killing the Goose that Laid the Golden Egg?"

Summary: TPG cautions investors that conventional wisdom incorrectly believes the government's "hands off the Internet" policy actually promotes its growth. That's overly simplistic. TPG believes **the lack of a vigilant national Internet/broadband policy is actually threatening to devalue the Internet** and risks "killing the goose that laid the golden egg." Industry lobbying has effectively undermined long-standing bipartisan policy that has fostered growth, competition, consumer choice, and innovation of the Internet. Specifically, the current state of schizophrenic infrastructure regulation (telecom vs cable) is leading to a breakdown of what makes the Internet valuable. For local telcos, the FCC has a hyper-regulatory policy, micromanaging most prices and product terms to achieve predetermined market outcomes. For cable operators, the FCC effectively has a "trust and don't verify" policy where even contemplating regulatory enforcement is taboo. Essentially, the FCC tacitly has picked cable technology as its broadband winner. However, exclusively encouraging cable deployment neglects the big picture: development of a **BALANCED national broadband policy to ENHANCE THE VALUE of the Internet OVERALL. The Internet is more valuable than the sum of its parts.** Policy neglect and industry-fueled partisanship devalues the Internet through fragmentation, cartelization, and politicization.

What's the Origin of the Internet's Value? The Internet has been a public commons that **no one owns**, but everyone can use freely. The Internet is **not the physical infrastructure**, but the **virtual world of communications and e-commerce** that rides on top of the various technologies. It's a collection of universal communications protocols, open network rules, and cooperative agreements. While largely unregulated and free of government micromanagement, the Internet is not a law enforcement-free zone as many imply. **The Internet is a fragile network and market dependent on government stewardship to protect the "public" attributes that make it so valuable.** AOL, Yahoo, E-Bay, Amazon, ISPs and dot.coms simply would not exist in their current form, if not for the government's long-standing, bipartisan, national policy. That policy promoted growth, competition, consumer choice, and innovation by ensuring: (a) nondiscriminatory access to the network; (b) open network architecture; (c) cheap online usage; (d) commercial development; and (e) minimal regulation.

What Makes the Internet Valuable? Why is the Internet the proverbial "goose that laid the golden egg?" (1) The Internet is **interconnected** – it brings everyone together. Metcalfe's Law says the value of a network increases exponentially with

the number of users connected to it. (2) The Internet is **interoperable**; it integrates otherwise incompatible technologies fueling phenomenal increases in productivity, convenience, and efficiency. (3) With few barriers to entry, the Internet **allows easy competitive entry** for new businesses; it's an open, competitive, high-growth marketplace. (4) The Internet is an **engine of growth and innovation**. It enables new business models and ways of doing business by decentralizing control of the network and empowering end users. (5) The Internet **increases consumer choice** and decreases suppliers' control over markets. In sum, these extraordinary Internet synergies, efficiencies, and network effects make **the Internet overall worth more than the breakup sum of its parts.**

The Devaluing of the Internet: The FCC's shift toward a "hands off" policy has eroded the "public" value of the Internet, and incited a corporate tug-of-war over the "goose that laid the golden egg." The risk is that this tug-of-war for corporate control of the Internet's *public attributes* could cripple or kill the proverbial "goose" so it cannot lay any more "golden eggs." (1) **Fragmentation:** Rather than ensuring the Internet grows in value by fostering interconnection and interoperability (sections 251a and 256 of the 1996 Telecom Act), a neglectful "hands off" government policy devalues the Internet. The government is allowing cable, the leading residential broadband facility going forward, to disconnect competitors from their underlying Internet infrastructure and to maintain proprietary "telecom" standards when every other telecom carrier must be interoperable by law. By not even bothering to ask whether cable broadband is a "telecom" common carrier service as the Ninth Circuit recently ruled, the FCC unwittingly has added to the investment uncertainty. (2) **Cartelization:** Rather than ensuring the Internet remains open and competitive, the FCC has acquiesced to cable's market power, permitted cable to erect multiple barriers to competitive entry, and tacitly promoted cable's first-mover advantage in a market where there is virtually no after-market customer switching. And four years after passage of the Telecom Act, which required "competitive availability of navigation devices" and telecom "interconnectivity," those procompetitive interoperability mandates have been unenforced by the FCC. (3) **Politicization:** After decades of bipartisanship promoting competition and innovation through open networks, industry has successfully driven a partisan wedge in Internet policy by making the government out to be the Internet "boogiemanager." A ridiculous charge given that the government developed, subsidized and commercialized the Internet and has a long suckled its growth through subsidies and minimal regulation.**

Pyrrhic AT&T/Cable Victory: Court Rules Cable Broadband Common Carrier

I. Summary: TPG believes many investors do not realize that **AT&T and the cable industry won a pyrrhic victory** in the 9th Circuit Court of Appeals ruling prohibiting Portland from mandating open access for competing ISPs. **While AT&T won a clear-cut technical victory that localities do not have regulatory jurisdiction, it clearly lost on the much more investment relevant definitional question. The court defined cable broadband as a common carrier telecommunications service, i.e., having the legal duty to provide nondiscriminatory access and to interconnect and be interoperable with competitive telecom carriers.** Investors should be skeptical of the current "spin" surrounding this decision. The cable industry has been telling any regulator, politician or investor that would listen for the last 18 months, that its **biggest fear was being subject to any kind of common carrier regulation because it would kill its incentive to invest in upgrading the cable infrastructure.**

II. What Did the Court Do? In order to make its jurisdictional decision on whether localities have authority to regulate ISP access to cable broadband systems, the court felt compelled to define what @Home does. It ruled that @Home has two elements: an ISP service and a cable broadband transmission component that is a common carrier telecommunications service. Key court conclusions: (A) *"We hold that (the law) prohibits a franchising authority from regulating cable broadband Internet access, because the transmission of Internet service to subscribers over cable broadband facilities is a telecommunications service under the Communications Act. Therefore, Portland may not condition the transfer of the cable franchise . . ."* (B) *"Under the Communications Act, this principle of telecommunications common carriage governs cable broadband as it does other means of Internet transmission such as telephone services and DSL, 'regardless of facilities used.'"* (C) *"We note the FCC has broad authority to forbear from enforcing the telecommunications provisions if it determines that such action is unnecessary to prevent discrimination and protect consumers, and is consistent with the public interest."*

III. Investment Implications: (A) **Winners and Losers?** TPG views this decision as a **significant long-term negative for AT&T and the cable industry and a significant long term positive for CLECs, ISPs and video streamers.** To test this assessment, **investors should ask AT&T if it embraces this court's ruling that cable broadband is a common carrier telecom service or whether it disagrees with this court that cable broadband is an unregulated cable service.** (B) **New Cloud of Investment Uncertainty?** This decision creates new investment uncertainty over what regulatory regime actually prevails for cable broadband or what a common carrier telecom definition means practically when applied to cable broadband. (C) **"Voluntary" Openness Accelerated?** Practically, this

decision could accelerate the timetable for cable's "voluntary" opening of its networks in hopes of heading off any future adverse regulatory intervention. (D) **Cable Acquisitions Overpriced?** TPG continues to suspect that AT&T overpaid for TCI and UMG and that cable is generally overvalued at \$5000 per subscriber. Those valuations were reached under the assumption of a closed, and not an open, business model, and the assumption that cable was unregulated and not subject to common carrier regulation.

IV. Regulatory Outlook? A Whole New Can of Worms? The FCC is now on the "hot seat." This court decision increases the likelihood that the FCC will have to act on the fundamental question of whether cable broadband is a Title II telecom service or a Title VI cable service. (A) **A Bipolar National Broadband Policy?** In the process of eliminating the potential for fragmented local broadband policies, the court still has undermined the FCC's view that one consistent national broadband policy is the best way to foster broadband deployment. This court has effectively bifurcated the FCC's national policy by ruling that in the one-sixth of the country under the Ninth Circuit's jurisdiction, cable broadband is a telecom common carrier, while in the rest of the country it is unresolved (cable maintains it's a cable service). (B) **FCC Willing to Cede Jurisdiction?** If the FCC continues to duck its federal communications policymaking responsibility by merely "monitoring" this fundamental unresolved issue, the practical effect could be to cede its authority to other jurisdictions: to the courts under section 406 or to the states under section 251a. (C) **Hands-On to be Hands-Off?** In an ironic twist, for the FCC to maintain its "hands off the Internet" policy, it now will have to undertake a "hands on" regulatory proceeding if it wants to forbear from regulating cable broadband as a common carrier.

V. Outlook For FCC Regulatory Forbearance? TPG believes **it is unlikely the FCC will be able to forbear completely from common carrier regulation for cable broadband.** (A) It would be tough *legally* because under section 10, the FCC must determine that regulation is unnecessary (1) to prevent discrimination, (2) to protect consumers, and (3) because it is in the public interest. The Department of Justice recently determined in its proposed consent decree on the AT&T-MediaOne merger that cable broadband has market power and that AT&T could anticompetitively "exploit its gatekeeper position in the broadband content market." That finding would appear to make it difficult for the FCC to rule there is no risk here of discrimination or any need to protect consumers. (B) It also would be tough *politically* to forbear because all other broadband providers, including incumbent telcos, would want equal deregulation as part of a national broadband policy. Furthermore, the FCC would have to argue that disabled Americans who have a right to special telecom access should not have the same access to cable broadband. * * * * *

AT&T-MediaOne/DOJ Consent Decree: Quietly Unwinding Cable Broadband Cartel?

Summary: A highly underappreciated investment event is the Department of Justice's (DOJ) analysis of the competitiveness of the broadband content market in the recent proposed consent decree for the AT&T-MediaOne merger. DOJ's analysis and its proposed final judgment are loaded with a surprising number of significant investment implications for broadband investors. A close read shows a much tougher and more far-reaching decision than the press release or the company "spin" indicated. (A consent decree is effectively a contract between companies and the government that, when ratified by a federal court, has the force of law.)

DOJ's Fundamental Conclusions: (1) The Anticompetitive Problem:

(A) "The predictions and assumptions required to conclude that the proposed merger would present serious anticompetitive problems in the future are very reasonable ones. Moreover, the risks to the development of the broadband industry posed by this merger are sufficiently grave that appropriate relief is warranted." (B) AT&T-MediaOne has market power to "lessen competition substantially in the aggregation, promotion, and distribution of broadband content." (C) "By exploiting its "gatekeeper" position in the broadband content market, AT&T could make it less profitable for unaffiliated or disfavored content providers to invest in the creation of attractive broadband content, and thereby reduce the quantity and quality of content available." (2) **Market Assessment:** (A) Broadband is a separate market from the narrowband dial-up Internet access market. Narrowband links "are not a good substitute" for broadband users. (B) "DSL still lags substantially behind cable modem service in market penetration and acceptance." And fixed wireless and satellite are not likely to be a major factor in the immediate future. (C) "Excite/@Home and Roadrunner together serve a significant majority of the nation's residential broadband Internet users."

(3) **Proposed Remedy:** (A) AT&T must divest MediaOne's interest in Roadrunner by 12-31-01, or sooner if practical. (B) The DOJ also wants "to prevent any coordination or collusion between Roadrunner and Excite @Home during the limited period of time that AT&T" owns both. (C) DOJ requires prior approval of any broadband agreement between AT&T and Time Warner for two years after the Roadrunner divestiture. (D) The DOJ and the Court would retain enforcement oversight powers for 10 years to ensure AT&T does not anticompetitively exercise market power in the broadband content distribution market.

Investment Implications: (1) Effective Decartelization of Cable Broadband Industry? While the decree is specific to AT&T, the message for the rest of the cable industry is pretty clear. The DOJ believes the broadband content distribution market is not fully competitive and fears the cable industry

may be operating as a cartel to snuff out potential broadband-content-distribution rivals, i.e., video streamers/Webcasters, before they can become video programming competitors. (2) **The Unwinding of the @Home and Roadrunner Alliances?** TPG expects the partners of @Home and Roadrunner to unwind their respective deals sooner than the contract terms. Now that the DOJ has determined cable broadband has market power, the structures themselves encourage anticompetitive collusion almost by design. (This partially explains AT&T's recent restructuring of the @Home partnership and the spate of "voluntary" offers by cable companies to provide "forced" access to competing ISPs when regulators are not requiring it.)

(3) **Effective Limitation on the Cable Broadband Business Model?** Apparently, the DOJ opposes cable efforts to migrate the vertically leveraged business model that cable employed to dominate video-programming distribution into the next-generation market for broadband content distribution. This decree also puts other cable companies on notice to compete rather than collaborate in broadband content distribution. Thus, TPG sees this decree as a negative for @Home, Roadrunner AT&T, Time Warner, and the rest of the cable industry because it means more future video programming competition from Webcasters than conventional wisdom appreciates. (4) **Effectively a Video-Streaming/Webcasting Protection Decree?** DOJ has maintained enforcement oversight to ensure potential broadband content distribution competitors have the ability to compete against AT&T. Thus, the decree is a positive for Yahoo-Broadcast.com, Disney-Go.com, Real Networks, Akamai-Intervu, Apple-Quicktime, Reel.com-HollywoodVideo, Microsoft Media Player, SnapNBC, Internet Ventures and AOL. (5) **Asset divestitures?** To comply with the FCC's ownership limits, AT&T has to divest either Time Warner Entertainment (TWE) or Liberty/Rainbow. TPG believes the DOJ's Roadrunner divestiture, combined with the FCC's tacit preference for selling TWE, makes a TWE spin-off most likely. Moreover, the likely IRS tax hit from selling Liberty and the complexity of divesting all of AT&T's miscellaneous content holdings argue for divesting TWE as well. If so, AT&T regulatorily overreached with the MediaOne purchase and ends up a cable system seller. (6) **AT&T Telephony Deal with Time Warner?** While AT&T still may be able to work out some type of telephony deal with Time Warner, the DOJ consent decree appears to prohibit AT&T from pressuring Time Warner for a telephony deal by withholding broadband access from AOL. (7) **Effect on AOL-Time Warner Merger Review?** TPG believes the AT&T-MediaOne consent decree represents a minimum set of requirements for AOL-Time Warner. Given AOL's majority share of on-line subscribers, the Federal Trade Commission will likely insist on a long-term oversight decree with strong anticompetitive behavior safeguards. * * * * *

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Scott C. Cleland
 May 25, 2000

Summary of Testimony Before U.S. House Commerce Committee on Broadband Deployment

Summary of written testimony of Scott C. Cleland, delivered May 25, 2000, before the U.S. House Commerce Subcommittee on Telecommunications, Trade, and Consumer Protection regarding the Deployment of Broadband Technologies.

[Note: This testimony significantly expands on TPG's Broadband Assessment, "The Developing Residential Broadband Gap," published February 8, 2000.]

For a copy of the full testimony, please contact TPG at (202) 778-1972.

I. Business Broadband Market Not a Problem, Residential Broadband Market Is

Capital-efficiency drives infrastructure deployment. Residences and small businesses are geographically dispersed and generate relatively low revenues, making deployment capital-inefficient.

II. Why a Residential Broadband Gap Matters

- Residential broadband infrastructure (i.e., consumer bandwidth) could very well emerge as the "Achilles' heel" of a video-enabled Internet, consumer e-commerce growth, and the New Economy.
- **With all the attention on clearing taxes and regulation from in front of the Internet "train," and keeping the "train fare" cheap, many are missing the obvious — that the Internet "train" hurtling forward on "Internet time" may abruptly run out of Internet "track" (i.e., consumer bandwidth).**
- If consumers don't have sufficient bandwidth, it doesn't matter how much video content supply there is, or how much consumer video content demand there is — it is not going to get delivered as consumers expect.

III. The Ten Developing Residential Broadband Gaps

1. **Supply & Demand:** While deployment is making real strides, relatively it lags substantially behind demand of video-oriented "dot-coms" and video streamers. Narrowband signups outpace broadband 8-1.
2. **Infrastructure Incentives:** The unintended consequence of the FCC's UNE-P resale strategy has been to **effectively devalue all infrastructure investment** by

incumbents and competitors alike, whether it is fiber, cable, or fixed wireless. Why overbuild if one can lease it more cheaply than one can build it?

3. **Revenue Efficiency:** Broadband physically consumes 20–100 times the scarce spectrum or bandwidth that narrowband voice or data currently consumes. Are consumers going to pay 20–100 times more? No.
4. **Depreciation:** Infrastructure replacement cycles for many fiber and wireless deployments are ominously outpacing their depreciation cycles, meaning investors may not recoup their initial investments.
5. **Competition:** **In the next three-to-four years, we project that up to 20% of the country may have a choice of three-to-four different broadband facilities, roughly 30% of the country may have the choice of two facilities, and one-half of the country may have only one or no broadband facility choice. We believe this projection is optimistic, given experience to date.**
6. **Competitive Churn:** There is negligible aftermarket competition or "churn" between broadband facilities because of the high cost and time hassle of switching. One analyst quipped that broadband churn is less than moving or death rates!
7. **Consumer Choice:** There is a stark gap between the consumer choice of ISP available on the open telco/fixed wireless broadband platform versus the closed cable broadband platform.
8. **Technology:** There is a wide gap in the business model viability of broadband technologies: cable, DSL, overbuilds, fixed wireless, and satellite. Cable and DSL are the only viable mass-market models.
9. **Personal Computer:** The current installed base of U.S. home computers is nowhere near broadband "plug and play," as the current narrowband dial-up market is. Practically, it's still a few years away.
10. **Inside Wiring:** Once one gets into the home, home networking is a veritable hornet's nest of issues. There are no home broadband standards, and there are major interoperability problems between technologies.

IV. Conclusion: All Is Not Well in the Residential Broadband Market

There are substantial economic, competitive, and technological impediments that appear to be creating an increasing gap between residential broadband deployment expectations and reality. * * * * *

Cable Open Access: Two Big "Open" Questions

Summary: Investors need to reassess carefully the cable industry's forward-looking business model now that the industry has apparently reversed course from a closed-access, "first-screen" leverage business model to at least the pledge of eventual open access and open broadband network. For well over a year, the cable industry has been convincing investors and regulators of the investment perils of an open model. Cable argued that cable open access was not financially viable, was not technically possible or feasible, undermined any incentive for cable to invest in broadband, would allow competitors to "free-load" off cable's investment, and would create a "dumb pipe" that cable companies would not want. Now, most of the cable industry — AT&T, Time Warner, Cox, Comcast, Charter, Adelphia — apparently support some kind of an "open" broadband cable network *sometime* in the future. **What is the impetus for reversing direction now?** Was cable incorrect in its previous assessment of an open cable network or is there new information or developments that fundamentally change the industry's previous assessment? Or, are the open access pledges a public relations ploy to mollify regulators? TPG identifies two big "open" questions for cable and related broadband investors: (1) what is the new "open" business model that justifies a \$4,000 to \$5,000 per cable subscriber valuation? and more specifically, (2) what is the "market-negotiated" wholesale access fee for use of a 6 MHz cable channel, a key assumption in an open business model?

What's Cable's New "Open" Business Model? TPG has long argued that cable's closed network model was unsustainable and that it was one of the most important investment issues for cable's emerging broadband business model. Cable's original closed broadband model was so appealing because cable appeared to have many of the characteristics of a high-growth monopoly, like Intel or Microsoft — i.e., a dominant share of a fast-growing necessary convergence building block — broadband access. The contrast between a closed and an open business model is substantial. **(A) The favorable aspects of a closed cable model are:** (1) allows a high-margin retail price; (2) generates "premium fees" from e-commerce "partners" given exclusive positioning on cable's "first screen"; (3) saves network design, construction and operating costs because a proprietary network is simpler and easier; (4) lowers customer acquisition and retention costs by excluding competitive ISP resale; and, (5) protects core video programming revenue base from eventual competition from video streaming. **(B) The unfavorable aspects of an open business model are:** (1) creates a lower-margin wholesale price; (2) generates no first-screen financial leverage; (3) increases network design, construction and operating costs substantially to support competitive resellers — ISPs; (4) increases customer acquisition and retention costs substantially by creating a competitive resale ISP market; and (5) creates the potential for increased video programming

competition to cable's base from video streamers. In a nutshell, the difference between the closed and open network business models is competition and price; in other words, to the extent the network is "open," it yields lower margins and higher costs than a closed network. An open wholesale model, however, is likely to generate more revenues than a retail model, albeit less profitably.

What's the Price for Wholesale Cable Broadband Access? TPG believes anticipating the likely wholesale price for all or part of a 6 MHz cable channel will be key to valuing cable's "open" business model. With the caveat that such an estimate requires many large assumptions, TPG attempts to offer some very rough proxy estimates to help investors start to get a handle on the potential wholesale access price. (1) **Cable now receives roughly a \$19 access fee per broadband subscriber for the use of a 6 MHz channel.** (Using the \$40 @Home monthly bill as a proxy, 35%, roughly \$14, goes to @Home for the ISP, the backbone and the content: 65%, roughly \$26, goes back to the cable company, of which \$19 is for the 6MHz channel and about \$7 is for the cable modem.) (2) In an "open" competitive environment, cable spectrum is spectrum, whether it is used for basic TV, premium pay TV, or data. (While data are different from TV in being two-way, competitive ISPs may only need one-way downstream broadband spectrum just like a TV channel if they supply their own return path signal through the telco or wireless.) (3) The FCC calculates that the average implicit fee cable gets for a channel is \$0.30-\$0.50 per basic TV channel subscriber and \$0.80-\$1.20 per premium pay TV channel subscriber. **Thus \$0.30-\$1.20 is the average wholesale price "the market" puts on 6MHz of cable spectrum per subscriber.** (4) A core pricing assumption is whether or not a cable company allows the use of its data channels to be optimized through segmenting or partitioning — i.e., sending different signals down the same channel to different parts of the system. Cable could extract a higher wholesale price, if it engineers its system to prevent spectrum partitioning, because then one would have to multiply the \$19 per subscriber fee by the percent of data penetration to reach a comparable average per subscriber fee. (5) Another core assumption is whether a competitive ISP shares *only part of a channel*; then the access fee would be some *fraction* of the average channel fee. (6) **So, depending on one's assumptions, it appears that cable's current "exclusive" \$19 data wholesale access fee is roughly a few hundred to as much as a few thousand percent higher per subscriber MHz than cable gets for selling its spectrum in the "competitive" video programming marketplace.** If cable continues to be the dominant residential broadband access technology, and if cable can restrict the supply of spectrum available for residential broadband data use, it appears cable could continue to enjoy a substantially above-market price for its broadband data spectrum. * * * * *



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 February 22, 2000

Webcasting: Can the Internet Grow Up to Video?

Summary: While most expect that the Internet will naturally evolve to provide mass market video, TPG believes that evolution will prove more problematic than expected because there are more serious impediments than most appreciate. There are significant legal, regulatory, and business model impediments to this evolution, in addition to "The Developing Residential Broadband Gap" impediment that TPG flagged in our 2-8-00 research piece.

The Internet Clearly Wants to Grow Up to Video: Ponder the slew of Internet or streaming video-related activity: AOL-Time Warner, Yahoo-Broadcast.com, Real Networks, Akamai-Intervu, Apple-Quicktime, Disney-Go.com, Reel.com-HollywoodVideo, Microsoft/MediaPlayer, Snap-NBC, etc. They are clearly anticipating the dawn of the video-enabled Internet. And consumers clearly want more choice and control over what and when they watch. Consumers have proven they like "time-shifting" and being their own personal programmers: e.g., VCRs, video rentals, pay-per-view, and DBS multiplexing.

Big Impediments Blocking Internet's Evolution to Video: The beginning of this evolution has already prompted notable clashes in all three branches of the U.S. government. A federal court has placed a temporary injunction on iCraveTV, blocking it from distributing U.S. video programming over the Internet. Congress is wrestling with whether Internet providers are due a compulsory license for video programming like cable and DBS currently enjoy. The issue surfaced last fall in a nasty 11th-hour skirmish during final passage of the Satellite Home Viewer Act and resurfaced recently in congressional hearing. And, as expected, the FCC recently denied a petition by Internet Ventures to offer video programming competition over the Internet using the 1984 leased access provisions.

Legal Impediments: The near hysteria that content owners like Time Warner and the NFL have had over iCraveTV's pointing a crude Internetcam at a TV set underscores how frightened big copyright owners are that Internet distribution undercuts the value of their content by facilitating illegal copying and piracy. The vehemence of copyright owners' reaction is telling. This skirmish may be just the tip of an iceberg; the big copyright owners are terrified that they may be the "Titanic" that could sink if the Internet blows a hole in their control over how their product is distributed and paid for. TPG expects the resolution of this copyright equity issue to be difficult and protracted. It is the proverbial clash of the irresistible force of consumers' freedom of choice over how and what they watch — meeting the immovable object of the very powerful copyright and sports lobbies in Washington. **Eventually, this has to get resolved either through negotiations or legislation.**

Regulatory Impediment: Current FCC cable broadband policy effectively protects cable from any Internet video competition

(i.e., mandated interconnection, resale or leased access) in order to encourage cable broadband investment and encourage cable telephony competition to the local telcos. Under the claim of "not regulating the Internet," the FCC effectively has a de facto cable industrial policy choosing cable as the winner over other telecom broadband technologies like DSL and fixed wireless. The FCC has not "exempted" DSL or fixed wireless from common carrier obligations of interconnection, resale and interoperability, as they de facto have with cable to date. Ironically, cable, which has 84% share of the residential broadband market, has little intention of letting the Internet grow up to video and compete against cable's \$30 billion revenue base. Cable orchestrated the ban on more than 10 minutes of streaming video and created @Home and Roadrunner as sophisticated "moats" to guard cable's \$30 billion video distribution "castle" against competition. **As long as the FCC's primary goal is status quo, to promote cable deployment and not competition to cable, the Internet's evolution to video won't meet expectations. (Important caveat: The FCC's recent denial of Internet Ventures' (IVI) petition to use leased access was very narrowly drawn. The FCC only decided that an ISP that did more than offer video programming, like email, was not technically considered video programming under leased access law. However, the FCC decision also suggested that a pure video programmer using Internet technology (read pure video streamers) "would not automatically run afoul of the threshold issue necessitating denial of the IVI's petition." The FCC left open the door for pure video streamers to request leased access to a 6 MHz channel to offer an alternative competing package of Internet compressed cable channels. Investors should expect to see another petition from a pure video streamer relatively soon.)**

Incumbent Impediments: Another powerful impediment to the Internet's evolution to video is the threat to old media's existing business models. New entrants, who are enabled by Internet technology and more efficient Internet-distribution-based business models, threaten to destabilize existing markets and snatch market share. However, these old media players are among the most politically powerful and legally astute industries. They are not going to give up video share to new Internet upstarts before exhausting every legal, legislative, political, regulatory, and acquisition protective maneuver imaginable. **Interestingly, AOL-Time Warner could be the best positioned in this Internet-video-stalemate because they likely benefit most from the legal and regulatory status quo.** Arguably they now need regulatory or legal change less than any other player, because AOL-Time Warner would own over half of the Internet audience and one of the biggest chunks of the best available copyrighted content — potentially giving them massive "first mover advantage". * * * *

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Scott C. Cleland

February 8, 2000

The Developing Residential Broadband Gap

(Part II of Residential Broadband Outlook Series)

Summary: TPG spotlights a **major disconnect between perception and reality in the residential broadband market that could have far-reaching investment implications.** TPG believes investors will increasingly see the residential broadband infrastructure as the weak link in the evolution to a broadband video-enabled Internet, and as an **impediment to consumer e-commerce growth.** (Attached is an overview of the deployment status and eventual availability of the main residential broadband technologies.)

The Broadband Infrastructure Gap: Residential broadband deployment is not keeping up with the explosion of video-oriented "dot.coms" and video streamers, which will depend on dramatically greater bandwidth capacity. While residential broadband deployment has made significant progress, when viewed as a critical link in the growth of the business to consumer e-commerce system, it lags substantially. **The eight million new narrow-band dialup customers added in the last six months dwarf the roughly one million residential broadband customers added in the same period!** Moreover, the "cavalry" shows little evidence of coming to the rescue. AT&T, supposedly the main broadband deployment hope, currently has a cable modem penetration rate roughly 60% of the penetration rate of other top cable companies, all of which have considerably less scale and much weaker consumer brands. As for DSL, despite vastly greater resources and a better service reputation than cable, the telcos to date are signing up DSL customers at less than one-third the rate of cable. And residential fixed wireless has yet to show up. Both MCIWorldCom and Sprint apparently are withholding deployment as leverage to get regulators to approve their pending merger. To date, AT&T has used its fixed wireless effort primarily as leverage to get other cable companies to take AT&T telephony services. TPG strongly suspects that **the supply of residential bandwidth is not going to keep up with the voracious bandwidth demands of burgeoning video-dependent applications.**

The Broadband Competition Gap: Most still don't appreciate how weak the core economics are in overbuilding residential infrastructure. The extraordinarily low cost of capital over the past few years has effectively masked it. Nevertheless, local residential communications infrastructure remains highly capital-intensive and capital-inefficient given the low average value of a customer and their geographic dispersion. While the Internet may mean "the death of distance" in e-commerce, the Internet does not eliminate the cost of local facility construction or upgrades. We have seen this "competition gap" before. Competition in the residential broadband market is developing like facility telephone competition. Most all of the CLECs built

out to serve the same high-end customers, which met two criteria: high average customer revenue and geographic density. Despite industry pledges to offer broadband universally, it probably won't happen because it will be uneconomic for anyone to compete against a "first mover" in possibly half of the country. **In the next three to four years, TPG projects that up to 20% of the country may have a choice of three to four different broadband facilities, roughly 30% of the country may have the choice of two, and half of the country may have only one or no broadband facility to choose from.** That is optimistic given experience to date. And, so far, competition has been limited to initial sign-ups. There is negligible after-market competition or "churn" between broadband facilities because of the high cost and time hassle of switching.

The Broadband Technology Gap: There is also a wide gap in the business model viability of the different broadband technologies. **Cable:** TPG expects cable to remain the **primary residential broadband facility for the foreseeable future.** Cable already has a national broadband infrastructure into the home where consumers most need high bandwidth. It is relatively much cheaper and faster to add to cable a narrowband return path out of the home to make it two-way for data, than it is to add bandwidth to the existing two-way telco plant or to construct a new broadband plant from scratch. TPG seriously questions the "catch-up ability" of the other broadband technologies to "first mover" cable. **DSL:** TPG expects DSL to remain the secondary broadband infrastructure for the foreseeable future. So far, DSL has been a serial "just wait until next quarter" story. DSL rollout has been defensive to date, largely chasing cable into markets where cable already enjoys "first mover" advantage. And the telcos' pricing to date has been relatively expensive, a duopoly, not a market leader approach. **Overbuilds:** RCN, the only significant over-builder, has been very clear about its "cream-skimming" model - targeting only the densest, high-end markets. That's because it is not viable economically to build from scratch elsewhere. **Fixed Wireless:** Since fixed wireless has been underwhelming to date in the much more lucrative business market, it is highly questionable if it will be a competitive force in the foreseeable future in the much less economically viable residential market. Moreover, the scale players, AT&T, MCIWorldCom and Sprint, all plan to use fixed wireless as a "fill-in" offering where they do not have either cable or DSL to offer. **Satellite:** The technical and business model challenges of deploying two-way broadband satellite profitably remain substantially more difficult at all levels than the challenges that doomed the ill-fated Iridium narrowband business model. * * * * *

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Precursor Watch®: Residential Broadband Deployment Outlook

Residential Provider Wireline	Two-Way Broadband?	Estimated Residential Subscribers		Market Share	Estimated "Footprint" Growth					Approximate Current Retail Pricing	Download Speed	Upload Speed @Home
		1H99	New 2H99		Total	1999	2000	2001	2002			
Cable Modem Cable and AT&T	Yes (most*)	950,000	750,000	1,700,000	84%						Start-up: \$75, \$40 Monthly: (\$0 - \$150)	~128 kbps
xDSL ILEC, CLEC, IXC	Yes (most*)	100,000	200,000	300,000	15%						Start-up: \$100, \$50 Monthly: (\$0 - \$200)	~256-500 kbps
Overbuilders RCN (cable modem)	Yes (most*)	13,000	9,000	22,000	1%						Start-up: \$0, \$40 Monthly: (\$0 - \$300)	~128-256 kbps
Electric Lines Media Fusion? (Experimental)	Yes	0	0	0	0%	(Questionable technical viability)					n/a	n/a
Terrestrial Wireless*** Digital TV Broadcasters/Geocast (54-746 MHz)	No	0	0	0	0%	(Questionable business model; not 2-way)					\$300	n/a
Wireless Loop AT&T Project Angel (Trial) (1.8-2.1 GHz)	Yes	0	0**	0**	0%						Start-up: \$0 (in trial), \$50 Monthly: n/a	~28-56 kbps
MMDS Sprint, MCI/Worldcom, etc. (2.1-2.7 GHz)	Yes	10,000	0**	10,000	0%						Start-up: \$150, \$40 Monthly: n/a	~150 kbps
LMDS Winstar, Teligent, Nextlink, etc. (24, 28, & 38 GHz)	Yes (long-term)	0	0**	0**	0%	(Questionable for residential service)					n/a	n/a
3G Mobile Wireless PCS (1.88-2.02; 2.11-2.20 GHz?)	Yes	0	0	0	0%						Start-up: n/a Monthly: n/a	~256 kbps
Satellite Existing Systems Hughes DirecPC (Ku band: 10-18 GHz)	No	40,000	0**	40,000	0%	(Telco return; not 2-way)					\$200	~384+ mbps
Planned Systems Skybridge/Spaceway, Teledesic (Ku 10-18/Ka 18-30 GHz)	Yes	0	0	0	0%	(Questionable technical viability and business model)					\$50	~28-56 kbps

KEY: Two-Way Broadband? FCC defines "broadband" as 200 kbps both ways. Footprint: Assuming ~100m U.S. households, circles depict estimated growth over time: = deployed; = potentially deployed long-term; = unlikely targeted for deployment. Pricing/Speed: We show price/speed packages for broadband plus Internet service, chosen from range of marketed--often conditioned--options likely to have broadband appeal; circles depict speed/size of "pipe." (*) @Home, SBC, GTE limit upload speed to 128 kbps at prices listed above; some cable modems still use dial-up return. (**) Amount is currently negligible. (***) Some spectrum (e.g., UHF channels 60-69, ultrawideband, unlicensed spectrum) is either not yet available, niche use, or both.