Barbara van Schewick
Assistant Professor of Law and (by courtesy) Electrical Engineering
Co-Director, Center for Internet and Society
Stanford Law School

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on Broadband Network Management Practices
at Stanford University, Stanford, CA on April 17, 2008,
Docket No. 07-52

Mr. Chairman, Commissioners,

Thank you for inviting me to testify today. My name is Barbara van Schewick. I'm an Assistant Professor at Stanford Law School; I also have a courtesy appointment at Stanford's Electrical Engineering Department. Together with Larry Lessig, I co-direct the Center for Internet and Society at the Law School. I have a PhD in computer science and a law degree. For the past eight years, my research has focused on the relationship between Internet architecture, innovation and regulation.

In my opening statement, I would like to make three points:

1. Allowing network providers to single out specific applications and block or degrade them to manage bandwidth on their networks would harm user choice and application-level innovation – the two things that the Internet Policy Statement is designed to protect.

2. Even with disclosure, the market will not solve this problem.

3. To protect application-level innovation and user choice, the FCC needs to clarify that singling out specific applications and blocking or degrading them to manage bandwidth on a network is not reasonable network management and violates the Internet Policy Statement.

Users choose the applications that best meet their needs and that provide the most value to them. If I'm working on an open source project that uses BitTorrent to distribute its source code, and the network provider chooses to single out BitTorrent to manage bandwidth on its network, I am unable to use the application that best meets my needs and use the Internet in the way that is most valuable to me. This is pretty obvious.

But what is the impact on application-level innovation? I recently met a graduate of Stanford's computer science program. Together with other graduates, he started a company that will develop a video application with a peer-to-peer component. Because he had a great concept, he was able to present his idea to six private equity firms. He entered into formal discussion with three. In these talks, the investors discussed the risk factors associated with his product. That network providers would block or degrade his application was one of the top risk factors for all investors.

If there was no market demand for his product, it would fail. And, worse, if there was market demand, it would be blocked. The more likely it was to succeed, the more likely it was to be blocked. Each of the three firms passed on funding his innovation.

This is a real problem. This story is not unique. And this story will become the norm unless the FCC adopts some baseline protections ensuring that network providers cannot target and degrade particular applications to manage bandwidth on their networks.

In my submitted testimony, I discuss three points.

First, I explain the need for more in-depth and standardized disclosure for consumers.

Second, I explain that the current level of disclosure in the US marketplace is inadequate.

Third, I explain why disclosure is not enough and why the FCC must enforce clear non-discrimination principles beyond mere disclosure.

There is a market failure here, in fact several. First, we do not have effective competition in the broadband market. The market for broadband internet services is an effective duopoly. In addition, this market is afflicted with significant switching costs.

Second, because of the prevailing flat-rate pricing structure, network providers have the perverse incentive to block or degrade applications that consume more bandwidth or consume it in unexpected ways. If the use of the network increases, the network provider's costs increase as well, but due to flat-rate pricing, its revenue stays the same.

Third, the history of the Internet (as well as theoretical analysis) shows that network providers prefer solutions that constitute a "quick fix" without considering the impact on the long-term evolvability of the Internet. The deployment of asymmetric cable and DSL, network address translators and Comcast's tactics to manage congestion are all examples of this problem.

All this suggests that network providers will find it more attractive to choose a specific application and block or degrade it than to try to find a non-discriminatory way of managing their network. A large literature describes the problems for application-level innovation that result when network providers, not users, pick winners and losers among applications. This is worse. When network providers choose applications to degrade in order to manage bandwidth, they will use all sorts of criteria (is the application easy to recognize; does the application constitute a significant chunk of bandwidth; what are the applications blocked by a particular vendor's product), but these criteria are very different from the criteria users employ when deciding which application to use. It is impossible to predict which applications a network providers would want to block; today it's p2p, next year it may be YouTube, the year after that it may be this exciting new application that we haven't even thought of yet. The only thing we know is that the mechanism that is most attractive to network providers is most harmful for application-level innovation and user choice.

Telling Comcast that its particular practice constitutes unreasonable network management is not enough. Network providers will still have an incentive to single out specific applications, and the risk of being blocked if they are successful will still be the number one risk factor for applications developers and investors who consider potentially bandwidth intensive applications. By declaring

that "reasonable network management does not include practices that single out specific applications and block or degrade them to manage bandwidth on their networks", the FCC can restore application developers' and investors' confidence that they will be able to use the network. This ability to use the network is not unlimited. Network providers will still need to manage congestion on their network, but the tools they use will affect all applications, and won't just make one application the odd man out.

In the Internet Policy Statement, network management is the exception, not the rule. The rule protects application innovation and user choice. Allowing network providers to target specific applications to manage bandwidth on their networks would make the rule meaningless. It is on the FCC to prevent this from happening.

Thank you for your attention, and I'm looking forward to your questions.