Please accept these reply comments in the matter of Schools and Libraries Universal Service Support Mechanism [CC Docket 02-06]

I am the Director for High Performance Networking at Merit Network, Inc. I have been involved in E-Rate matters since 1997 as part of the Michigan Information Network Work Group (MINWG), a volunteer outreach effort that makes E-Rate information and assistance available to schools and libraries in Michigan. I was a member of the Schools and Libraries Division Year 3 E-Rate Task Force.

Merit is a non-profit ISP formed in 1966 to connect three Michigan universities over experimental network links. Today Merit operates MichNet, part of the Internet in Michigan, as well as the Michigan GigaPoP which provides Internet2 access to Michigan organizations. Merit managed NSFNET, the forerunner of today's commercial Internet, from 1987 to 1995. Merit provides Internet services to over 250 organizations including public and private colleges and universities, community colleges, K-12 schools, libraries, federal, state, and local government agencies, health care organizations, and some for-profit businesses.

I would like to support and expand upon the comments made by Robert Bocher of the Wisconsin Department of Public Instruction dated March 28, 2002.

Like Mr. Bocher, I too believe that Internet2 access should be eligible for universal service support discounts. I believe that Internet2 access should be eligible either:

(1) as "Internet access" under existing universal service regulations, or
(2) as an "Advanced Information Service" under 47 USC 254(h)(2)(A).

The access to advanced content and applications that is made possible through access to Internet2 seems to be just the sort of access that Congress had in mind when they directed the FCC to "establish competitively neutral rules-(A) to enhance, to the extent technically feasible and economically reasonable, access to advanced telecommunications and information services for all public and nonprofit elementary and secondary school classrooms, health care providers, and libraries" [47 USC 254(h)(2)].

Access to Internet2 from K-12 schools and libraries expands the range of resources and services that are available to students, teachers, and library patrons. Internet2 access has the potential to transform research and education in the United States and beyond by allowing the development and deployment of advanced networked applications that do not run at all or do not run well on today's commodity Internet (the commodity Internet is that part of the Internet that isn't Internet2).

Examples of applications that require Internet2 capabilities include:

- --Video - in all forms, two-way interactive, one-way, streaming, better than broadcast quality interactive video is probably the "killer" application for Internet2
- --Multimedia resources for "papers"
- --Remotely controlled instruments, devices
- --Computationally intensive distributed applications
- --Very large and/or distributed databases

--Peer-to-peer applications
--Other applications yet to be discovered

Examples of Internet2 use from K12 schools:
--Language students talk with students in a foreign country
--Music students benefit from access to a distant teacher
--Virtual Field Trips, Truman Presidential Library
--Helping schools, education schools, and student teachers interact
--Remote Use of an electron microscope
--High definition video from the International Space Station
--Live from the Kennedy Center for the Performing Arts
--Virtual anatomy
--Individual 2000 Census Data

Internet2 access is Internet access, the networks that make up Internet2 are part of the worldwide network of TCP/IP networks that is the Internet. All sites on Internet2 are also on the commodity Internet, usually with a single connection to both, but sometimes with separate connections to each. Internet2 and the commodity Internet both use the TCP/IP protocols (IPv4 and IPv6), both use the same IP addresses, domain names, LANs, computers, browsers, and many other applications. It is often difficult for end users to know if they are using Internet2 or the commodity Internet.

Internet2 is not a single network. The Abilene backbone, the primary Internet2 backbone network which is run by the University Corporation for Advanced Internet Development (UCAID), connects research and education organizations (R&E), GigaPoPs (regional aggregation points or networks), which in turn connect research and education organizations, businesses that are collaborating with R&E, and state education networks, which in turn connect schools, school districts, libraries, and library systems. There are gateways between the very high-speed Backbone Network Serivce (vBNS and vBNS+), a high performance research network that was originally sponsored by NSF and which is now run as a commercial network by MCI/Worldcom, to federal agency networks run by NASA (NREN), the Department of Defense (DREN), and the Department of Energy (ESnet), as well as to international research and education networks.

GigaPoPs are very high speed regional aggregation points or Points of Presence. They are organizationally separate from Internet2/UCAID and Internet2 access for K-12 schools and libraries is provided by GigaPoPs or state educational networks connected to GigaPoPs and not directly by Internet2/UCAID. Some GigaPoPs are state educational networks, others provide connections to state educational networks. GigaPoPs may or may not also provide commodity Internet access. It is the GigaPoPs or the state educational networks rather than Internet2 that participate in universal service support program by providing discounts to eligible schools and libraries.

I believe that the access provided by the collection of networks that make up Internet2 meets the definition of "Internet access" found at 47 CFR 54.5 and that Internet2 provides services for a fee directly to the public, or to such classes of users as to be effectively available directly to the public.

Access to Internet2 is separate from access to content that may be

available over Internet2 and access to Internet2 does not require membership in Internet2. And, while some organizations may choose to become Internet2 members, most K-12 schools and libraries will not. Fees or portions of fees paid for access to content or for membership where membership includes more than network access should not be eligible for universal service discounts, just as they are not eligible for discounts on commodity Internet access.

I offer the following items as possible replacements for the two existing Internet2 entries in the Schools and Libraries Division Eligible Services List:

Internet2 Access as a telecommunications service:

Internet2 is a consortium of universities, industry, and government organizations working to promote the development and deployment of advanced network applications, services, and technologies.

A telecommunications link that provides an eligible entity with access to Internet2 is eligible for discount.

Internet2 access may be eligible as Internet Access. See the "Internet2 access" entry in the Internet Access section.

Eligible: Yes

Internet2 access as Internet access:

Internet2 is a consortium of universities, industry, and government organizations working to promote the development and deployment of advanced network applications, services, and technologies.

"Basic conduit access" to Internet2 is eligible for discount. See the "Basic Unbundled Access" entry in this section for more information.

Fees for membership or access to content to the extent that the fees include facilities or services beyond "basic conduit access" are not eligible for discount. See the entries for "Bundled Access", and "Internet content" in this section.

A link that connects an eligible entity to Internet2 can be eligible as a telecommunications service. See the "Internet2" entry in the Telecommunications Services section.

Eligible: Yes