

ILLINOIS CENTURY NETWORK

**NETWORK OPERATING POLICIES:
REVIEW OF ICN-PROVIDED SERVICES AND EQUIPMENT
AND COST RECOVERY POLICIES**

Submitted for: Action

Summary: The Illinois Century Network Act, PA 91-21, instructs that the ICN is to *maintain sufficient capacity to meet the requirements of the participating institutions*. In order to fulfill this requirement, options must be considered to replenish finite network resources. This item examines ICN-provided services and equipment and recommends a strategic plan to adopt a cost recovery model in order to ensure long-term viability of the network and to attain equity for all ICN primary constituents.

Action Requested: The Illinois Century Network Policy Committee is requested to approve long-term operating policies to guide staff in providing services and equipment on the basis of scalability and sustainability. Further, staff asks that the Policy Committee authorize the development and adoption of a cost recovery funding model as described.

Recommended Motions: *The Policy Committee adopts staff recommendations to discontinue providing customer premise equipment and access transport circuits as described and to provide access transport circuits only as described in the Community Network model, when provision of access transport circuits reduces costs for both the ICN and the community connecting to the network.*

The Policy Committee authorizes staff to establish a long-term funding model that provides base services and transit to primary constituents and employs reasonable cost recovery such that the network is able to continue providing services and expand as needed. The cost recovery model is to be structured in a manner that provides the greatest benefit to primary constituents.

ILLINOIS CENTURY NETWORK

NETWORK OPERATING POLICIES: REVIEW OF ICN-PROVIDED SERVICES AND EQUIPMENT AND COST RECOVERY POLICIES

The Illinois Century Network Act, PA 91-21, Section 10 instructs that the ICN is *to maintain sufficient capacity to meet the requirements of the participating institutions*. In order to fulfill this requirement, options must be considered to replenish finite network resources. This item examines ICN-provided services and equipment and recommends a strategic plan to adopt a cost recovery model in order to ensure long-term viability of the network and to attain equity for all ICN primary constituents.

A Brief History of ICN Funding and Benefits to Constituents

The ICN, as originally conceptualized by a statewide taskforce, was to be a higher education network. As such, original plans called for funding for a backbone network as well as access circuits. Since combining with the LincOn network, the mission of the ICN as defined by enabling legislation, has expanded. The LincOn network, operated by the State Board of Education prior to merging with the ICN, was funded at approximately \$10 million per year from fiscal years 1995 through 1999. Its primary mission was to provide Internet connectivity for K-12 schools. It was originally established to serve public schools and expanded later to serve private schools. In 1999, the State Board and Board of Higher Education combined their efforts. Funding from the State Board increased to \$12 million and the Board of Higher Education received \$15 million during that fiscal year. Prior to merging with the ICN, some annual fees were associated with the LincOn network but were discontinued in 1999.

Originally, the Board of Higher Education budget for the ICN was split between access and backbone expenses with approximately \$8 million earmarked for the construction of the backbone and \$7 million targeted for access circuits and equipment. In addition, due to the long delays in acquiring necessary backbone circuits, some funds were made available on a limited basis to assist libraries and museums in connecting to the network. K-12 schools received no funding from the ICN for access circuits or equipment but were recipients of various technology grants administered through the State Board of Education. Current assistance provided by the ICN in the form of equipment and services are noted in Table 1.

In addition to providing some constituents with access circuits and equipment, the ICN provides all constituents with a connection port at a point of presence located in each Market Service Area (MSA) at no expense to the constituent. This means that any

constituent can connect to the ICN without paying for higher cost long distance circuits. Although most constituents provide their own circuit or access transport¹ to the network, the ICN provides transit² to the Internet as well as interconnection of all constituents to one another.

Table 1
CURRENT ICN ASSISTANCE
TO PRIMARY CONSTITUENTS
 Fiscal Years 2000 - 2001

ENTITY	ROUTER PROVIDED	END DATE	CIRCUIT	TYPE	END DATE	COMMENTS/NOTES
Public K12	No	-	No	-	-	
Private K12	No	-	No	-	-	
Public University	Yes	ongoing	Yes	DS3	Ongoing	
Branch (Teaching)	No	-	No	-	-	
Community College	Yes	ongoing	Yes	DS3	Ongoing	
Branch (Teaching)	No	-	No	-	-	
Private University	Yes	ongoing	No	-	-	
Branch (Teaching)	No	-	No	-	-	
Private College	Yes	ongoing	No	-	-	
Branch	No	-	No	-	-	
Libraries	Yes	see note	Yes	T-1	30-Jun-01	Must apply by June 30
Museums	Yes	see note	Yes	T-1	30-Sep-01	Must apply by Sept 30
All other	No	-	No	-	-	

NOTES: ¹Libraries and Museums ordering circuits by the deadline will be reimbursed for installation charges even if after deadline.

²All ongoing assistance is subject to regular review and availability of resources.

Difficulties Created by Current Operating Policies

Current operating policies create several distinct problems. Although the ICN began its life as two separate networks with two separate budgets it operates today as a single state network serving all sectors of education and other constituents. The question

¹ Transport correlates to the physical access circuit connecting a constituent to the ICN point of presence. Transport facilities follow standard telecommunications offerings and generally consist of circuits able to transport a particular number of megabits per second (Mbps). For example, a T-1 circuit has the capacity to transport 1.5 Mbps, 45 Mbps for a DS3 circuit, 155 Mbps for an OC3, and 620 Mbps for an OC12.

² Transit refers to the actual throughput on a physical circuit. For example, even though an institution may have a circuit that allows a particular speed, the actual transit can be controlled by the network hardware. A constituent with a 45 Mbps circuit may be 'rate-limited' to 30 Mbps.

arises routinely as to why the ICN provides disparate services to different constituents. Another question pertains to the responsibility of the ICN to provide increases in transport and transit as well as upgrades to equipment.

A further and more significant issue arises when considering that the ICN provides transit to the commercial Internet at no expense to any constituent. Since constituents have no cost associated with connection there is little or no incentive to manage traffic. Currently the ICN is operating at ninety-three percent (93%) capacity of existing egress to the Internet. Although the growth in constituents clearly calls for additional capacity, this additional capacity will be but a temporary fix unless policies are put in place that encourages prudent use of available resources. For example, if a university utilizes 30 Mb of transit to the Internet and, upon examination, ICN staff find that almost 60% of the traffic is related to student recreational use of the Internet, there is no policy in place that allows the staff to effectively limit transit.

The problem of supply and demand arises as a result of a limited quantity of transit to the commercial Internet and no limitation placed on individual constituents. If a limit were to be placed on constituents, it is not the role of the ICN to determine which traffic is priority and which is non-priority other than ensuring sufficient resources to serve primary constituents. This problem is amplified when considering the effect of community networks and connecting municipalities that serve as local Internet Service Providers. In summary, supply cannot keep up with demand under the current operating model.

Recommendation for Adoption of a Long-Term Funding Model

A long-term funding model must be adopted in order to continue to expand the network to meet demand. If the ICN is to operate with existing funds, a cost recovery policy must be instituted or additional funds must be secured in out years to maintain long-term viability. While additional funding may be necessary at some point, it is prudent to develop a long-term funding model that shares some of the ongoing costs with the direct beneficiaries. In surveying twenty-eight other state networks, most have adopted a cost recovery model to assist constituents in prioritizing network traffic and expand their respective networks to meet increasing demands.

Although the ICN originated as a result of two separate initiatives, today it operates as a single network. As such, all constituents should be treated equally with primary constituents receiving discounted pricing or additional services at ICN expense. The costs associated with telecommunications networks is well known and consists of Internet transit and transport, points of presence and associated equipment, local loop transport circuits to access the backbone network, customer premise equipment, maintenance, local support, network operations center, and other client services. Note the Illinois Century Network Costs Graphic (attachment).

Staff recommends the following:

- 1) All ICN constituents will be required to provide customer premise equipment (CPE), access transport circuits, and necessary maintenance and software upgrades to CPE.
- 2) The ICN will fund circuits to constituents only as described in the Community Network model, when providing the access transport circuit reduces costs for both the ICN and the community connecting to the network.
- 3) The ICN will provide a specific amount of transit on access transport circuits for primary constituents to ICN points of presence and maintain sufficient egress and backbone capacity to route such traffic to other points on the network and to the Internet. Transit above the minimum set amount will be provided on a cost recovery basis that will be evaluated and determined annually.
- 4) The minimum set amount of transit will be such that the majority of primary constituents that are of smaller size and scope will not be required to pay for service. The amount of transit provided will be evaluated annually and adjusted depending on ICN resources, market costs, and demand.
- 5) Other entities who may be eligible to connect to the ICN will provide customer premise equipment (CPE), access transport circuits, necessary software upgrades to CPE, and will be charged for point-of-presence port charges and transit over the backbone and to the Internet on a cost recovery basis that will be evaluated and adjusted annually.
- 6) The ICN will allow creation of private virtual circuits on backbone circuits where bandwidth permits on a cost recovery basis only and will not fund any circuit that does not connect directly to the ICN.
- 7) ICN funding and provision of customer premise equipment will cease effective June 30, 2001 unless other deadlines have been established.
- 8) Current funding for access circuits will cease effective June 30, 2002 in order to allow budget planning for affected entities unless other deadlines have been established.

The staff recommends the following resolutions:

The Policy Committee adopts staff recommendations to discontinue providing customer premise equipment and access transport circuits as described and to provide access transport circuits only as described in the Community Network model, when provision of access transport circuits reduces costs for both the ICN and the community connecting to the network.

The Policy Committee authorizes staff to establish a long-term funding model that provides base services and transit to primary constituents and employs reasonable cost recovery such that the network is able to continue providing services and expand as needed. The cost recovery model is to be structured in a manner that provides the greatest benefit to primary constituents.