Advanced Engineering Taskforce Transition Team Report

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Report from the Advanced Engineering Taskforce of the Illinois Century Network

The Illinois Century Network (ICN) is one of the most successful and well-received programs that state government has ever operated. Within its first few years it has connected most of Illinois' schools and colleges to the Internet, as well as providing access for museums, libraries, and an increasing number of municipalities and hospitals. Our ranking among the states has risen to the top for both educational networking and for electronic state services. This first phase of achieving connections has made future opportunities extremely attractive in areas of the state not currently well served by education, healthcare or information services.

While ICN is operated within state government, with the oversight of a Policy Board appointed by the Governor and currently chaired by the Governors Chief Technology Officer, it has successfully engaged its major constituents through advisory groups. The Advanced Engineering Taskforce is drawn from institutions and municipalities that are served by ICN, primarily from those with demonstrated leadership within their sector. This includes several people who have been involved in the development of the Internet from its beginnings. Included are members from school districts, all levels or higher education, museums, libraries and municipalities. Many of the members were involved in developing the proposal which eventually resulted in ICN's creation.

ICN is very unusual in that it has brought together programs from all levels of education, both public and private, into a single network. In most states there are separate organizations, and much less strategic programming. Most of ICN's public sector constituents are under primarily local governance, but the success at making this a constituent based organization has kept their view of ICN very positive. ICN is essential to a number of other state funded education projects such as the Virtual High School, the network of libraries (ILCSO) and the Virtual Campus.

ICN does not own telecommunications facilities, but is a large customer of the multitude of telephone companies in the state. The majority of the ICN budget is used to purchase circuits and networking equipment. It assembles these commercially available circuits and equipment into a network that ICN operates for the benefit of its members. In addition to traditional telephone companies ICN will be working with cable television companies for some local connections, and with the emerging wireless communications companies to serve less populated areas. The latest initiative, which is critical to controlling costs despite traffic growth of more than 100% per year, is to lease dedicated fiber for the central core of the network. Once in place this will support many years of growth and collaboration with the most advanced national and international networks. Illinois, primarily through the Chicago area, is the US interconnection point for much of the European, Asian and South American traffic reflecting both the history of Illinois as a national communications hub and Illinois institutions role in the development of the global Internet.

The Internet, and ICN as the provider for much of the public sector in Illinois, has the potential to help many people gain access to important services. It is particularly critical to those who live in areas which are also underserved by healthcare and education, and where government services are inconvenient to reach. These areas are typically very rural and/or have high poverty levels. They are not sufficiently attractive to utilities such as telephone and cable television to attract investment necessary to provide new services. These areas should be a continuing target for state funding and ICN attention. Some of the greatest opportunities for Illinois use of Internet services are in these areas.

The driving force for the ICN legislation was education, and ICN has connected the vast majority of educational institutions at all levels. Intended uses went far beyond simply connecting to this information resource, and included the ability to deliver courses when and where they are not normally available, such as introductory calculus in high schools where there is no local teacher available. Other examples include making job training available online, offering continuing education for those already employed but needing updated skills, and offering high school and college education to those who cannot attend regular classes. The latter range from prison inmates to the homebound, as well as many who must balance education with full time employment. A vast amount of material is becoming available, and the state should focus resources on access and promotion of such programs. The major suppliers of material include both educational institutions and the libraries and museums that are also participants in ICN. Organizations as diverse as Cooperative Extension, the National Center for Supercomputer Applications, the Illinois State Museum, and the Art Institute of Chicago provide heavily used material.

Healthcare is one of the areas where Internet capabilities are becoming very important. Collaboration of medical center specialists with rural providers can make diagnosis and treatment in rural areas both more timely and more skilled. One example where there are already success stories around the country is in treating burns from accidents and fires. This requires highly trained specialists who are available only in major medical facilities. Training of medical technicians and professionals is a process that continues during employment, and both community colleges and medical centers provide such courses. Illinois has major advanced medical centers that can use ICN to support such services. We can attract federal funding aimed at both rural medicine and other digital divide opportunities. For both education and healthcare the bandwidth of ICN to these more rural areas needs to be greatly increased.

Security services, emergency response, and coordination of organizations can be enhanced with networked communications services without significant cost. As the municipalities and state agencies are attached to the network they can develop effective models to communicate and share information sources, forming temporary clusters for dealing with specific problems. Most federal agencies are already connected via ICN's attachments to the national Internet services that are highly reliable and have redundant paths. This is an area where performance can be greatly enhanced within existing funding.

Various state agencies are moving towards Internet delivery of both information and transactions. The potential is there to reduce cost by moving more of these functions online, and by consolidating delivery of multiple services via a consolidated site with access to all state agencies. In addition to controlling costs, the service to the citizen is improved in both timeliness and convenience. Many services can be delivered using home computers, public access locations in libraries and government offices.

The most difficult issue for ICN and the state to deal with is economic development based on Internet services. In many areas there is a robust and competitive market among service providers. In other areas, both in the inner cities and in more rural areas, there is a total abrogation of the American tradition of universal availability of services. With the exception of the federal program known as e-rate, which subsidizes poor areas educational communications, there is no commitment to making all geographic areas able to grow in the new economy. This is not just a burden for ICN to face, but an opportunity that state government can attack to assure the future of the state and all its citizens. While the state should simply provide a good environment for development for areas where there is adequate competition, it should develop a policy and financing strategy to provide equitable opportunity in those areas which will not otherwise flourish.

ICN has had very favorable impacts on the economics of networking for its clientele, and on state telecommunications costs. The most obvious is that the state appropriated funds of approximately $25M, which help cover the costs of the broad infrastructure. Beyond this, however, the impacts are even larger. Though its consolidated purchasing power ICN has been able to get much lower costs from telecommunications companies, and drawing on the AET familiarity with the competitive nature of the market has done far better than traditional state procurements of these services. This has fed back into some lower costs for other state organizations. ICN has also consolidated the procurement of circuits paid for by member institutions, getting both better pricing and more rapid delivery. More recently this has been expanded to include some of the equipment used in the network. Taken together these efforts have helped avoid major budget increases despite very rapid growth in capacity. The ICN budget is a small fraction of the total networking costs of its clients, but has had a disproportionate impact on keeping those costs under control.

What is needed to continue the success of ICN the same as what has been critical during the initial phase. The relatively independent organization with constituents involved in planning and governance is essential. Focused goals and the ability to move rapidly towards them depend on both the organization's leadership and its ability to conduct independent purchasing and contracting. ICN is a good place to work and has been able to attract and retain a very competent staff, and this too depends on their ability to carry out plans in a timely fashion, consistent with the rapid development of Internet technology and use. Finally the clarity of the educational and service mission and support of that mission at the highest levels of state government is essential. With this continuing support ICN can help Illinois provide all its citizens with greater equity in education, health care and government services. Establishing an active role in economic development can add to that success.

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