



***Smart Community*©** **White Paper**

Version 1.1
June 2000

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1 Vision

In the past two centuries it was first waterways, then the development of railroads and then, inter-provincial and federal highways that determined the relative economic success of our cities and towns. Communities located along those routes were able to access the best technology of the times and could be deemed the *Smart Communities* of their time.

Today *Smart Communities* are those organized around the Information Highway through a high-speed, broadband, connection that interconnects every aspect of the community. In this respect the *Smart Community* of today is not restricted to a narrow geographical definition. While it could be, for example, a town, it could also be an economic region or an entire network of facilities, such as hospitals. Any group of people or organizations that share something in common be it a geographical region, interest, or vocation can be seen as a community.

Today's *Smart Community* uses, to its best advantage, every advance in communication technology that it can apply, both economically and to the benefit of its' constituents. It applies that technology to the broadest range of that community's activities as possible in order to create the maximum number of opportunities within that community. That maximization of opportunity does not just benefit that particular community but also, by extension, all those who help that community succeed. Therefore helping to create *Smart Communities* is *Smart Business*.

2 Identifying the Problem

The Internet has allowed all of us to communicate without geographic boundaries, increasingly creating a globally accessible wealth of information. As this pool of knowledge increases, the ability to find useful information decreases. With the Internet continuing to grow at exponential rates this excess of disorganized information poses critical problems:

1. The inability to create tools quickly enough that can scale to manage the increasing quantity of information.
2. The Internet's focus is on worldwide content which overlooks the importance of regionally based community content, needed to strengthen communities.

These two factors can be solved by the introduction of regional based community networks. This allows the content to share a common denominator with its viewers, geography. It would also allow the community access to services that current providers have had difficulty providing such as; high speed access, quality of service, video on demand, useful content, and low cost. These goals can be delivered within a regional network because of end-to-end network control, as opposed to the Internet, which is not controlled by any one organization.

3 Solving the problem

To build a successful network capable of this service level requires three components: access, transport, content.

3.1 Access

Low cost, ubiquitous, high-speed network access is central to the future growth and survivability of communities. Those communities that lack such access must begin to correct the problem now by identifying new access technologies that are quick to deploy and flexible enough to grow into the future. More important than the technology itself is the strategy used to deploy these technologies within the community.

To address this issue the concept of the *Smart Community* has been developed to allow communities to participate in the new economy. The *Smart Community* deployment strategy will include presentations to and discussions with various levels of government, organizations and businesses in order to quickly gain support for the *Smart Community* and attract customers to its network. During these discussions, the community's individual telecommunication needs as well as available funding and grants are identified and pursued by the community to subsidize the infrastructure costs wherever possible. The *Smart Community* is also expanded by utilizing a series of *Smart Community* agents that are capable of distributing network access and value added services through their existing customer base and their local reputation. Support for these efforts is provided through a central marketing campaign.

3.2 Transport

The network itself is generally the limiting factor when service strategies of this nature are deployed. The key is in putting together technologies capable of offering scalable bandwidth, centralized provisioning, and industry standard protocols. This allows the network to grow and be upgraded without interrupting customer service.

3.3 Content

Providing the high-speed network and facilities for application services hosting creates content. Hosting enables service providers to easily and economically reach their customers, while the network infrastructure enables application creativity. By using *Smart Community* Service Providers the network becomes a single-source for advanced communications products, such as: high definition television, high-speed Internet, local and long distance telephone, and Virtual Private Networks. Service Providers are encouraged to work together to enhance and promote each other's services thus building synergy amongst the content being offered, which results in a richer experience for the participating members of the community.

4 Building the Smart Community

The vision of *Smart Communities* together with Nortel Networks' concept of [Public Local Area Networks](#) (P-LAN) creates a powerful tool by which communities can not only take part in but also take a lead in the "New Economy".

4.1 What is a Public Local Area Network (P-LAN)

A Public Local Area Network (P-LAN) is a seed around which a *Smart Community* can develop. P-LANs represent a new approach to building and deploying computer networks. A P-LAN is a new business model, built upon a well-tested solution, applied to a new problem. That problem is; how in a global community and economy, brought about by the Internet, does a local community retain its sense of community, protect its economy and still provide its citizens with high-speed access to the Internet?

4.1.1 How does the P-LAN work

A P-LAN combines the best features of the Internet with the speed and exclusivity of a Local Area Network. A P-LAN works by giving every household and business in a community free dial-up access to the P-LAN. If that client wants access to the Internet it can be accessed through the P-LAN but for a fee and the cost of installing broadband access to them.

All participants in the P-LAN are given their own email address, web site, "white pages" listing and IP address.¹ This allows community members to communicate via local email with each other (not out to the Internet, and to put their businesses on the local web server. Users who dial in are connected only to the Public Local Area Network and can browse the websites on the local web server. This gives the local merchants an opportunity to market directly to their usual customers, providing everyone with the convenience of online shopping, without competition from the Internet. Local merchants can put up their own website and also purchase a listing in the local online "Yellow Pages" to give them more exposure.

Customers who want Internet access must arrange for the installation of a broadband (fiber, xDSL, wireless, cable) connection through a *Smart Community Agent* to their home/business and pay for monthly Internet access. To assist in the use and promotion of the P-LAN, Internet access will occur through the P-LAN portal or web site. Since broadband allows for 24 hour a day connection, to ensure users revisit the P-LAN web site, their web browsers will automatically reset to that site after a specified period of inactivity. This encourages Internet users to continue to support the local community.

¹ A P-LAN works in private IP space with the network service provider supplying Network Address Translation (NAT) when the client leaves the private IP space of the P-LAN and moves into the public IP space of the Internet.

4.1.2 How is a P-LAN Organized

A Public Local area Network is the most efficient and effective means through which to bring about the creation of a *Smart Community*. However, to produce a *Smart Community*, particularly at the civic or regional level, requires the willingness, and visionary participation of all levels of government, the business community and community organizations. While there must be leadership to initiate and guide the process, it takes a concerted effort, from all concerned, to bring about the community's vision.

4.1.2.1 Business

While for success there has to be significant “buy-in” at all levels, the level of merchant participation is absolutely critical. To get the end users to participate in the P-LAN there has to be sufficient content to draw them there and keep them there. That initial content can only come from local businesses and government services. This will require getting the local business community involved as soon as network services are available in their community and before the P-LAN exists. Business owners must be educated in the technology, the vision and the benefits to themselves and their community, and they must decide at what level they wish to participate, be it a simple web site and “yellow pages” entry, or a full-blown e-commerce site.

4.1.2.2 Government

Communities work best when the barriers to government for its citizens are lowered. The more access to local services and information the local government can make available to its constituents the more those citizens will get involved in the process. A P-LAN is a viable solution to a government's problem of disseminating that information. With a P-LAN every citizen has free access and an email address. That gives their government a ready avenue of communication with them. Convenient access to government services and information will greatly increase the use of the P-LAN and thereby its value to all; the citizens, the government, local business, the service providers and to the carrier.

Government can play another role as well, particularly when the community in question is a Tier 4 or smaller city. That role is in subsidizing the cost of the infrastructure. Typically, Tier 4 and smaller cities have too small a population base, or the population is spread out over too large an area, for a telecommunications carrier to justify providing the last mile broadband technologies that are central to the creation of a P-LAN. Those technologies include Fiber To The Home (FTTH), Fiber To The Business (FTTB) or Fiber To the Curb (FTTC). A community can work with all levels of government to find funds for infrastructure improvements in co-operation with a telecommunications company.

4.1.2.3 Network Provider

The network provider is the catalyst for the *Smart Community*. The network provider is responsible for building initial momentum in the community, financing, building, and maintaining the network, deciding on content from Service Providers, and seeking out and training appropriate agents in the community.

4.1.2.4 Agents

The agents will play a critical role in creating enthusiasm for the project from within the community because, for each community, the agents will be local businesses. As well, the more interest and participation agents create the more they are successful.

4.1.2.5 End Users

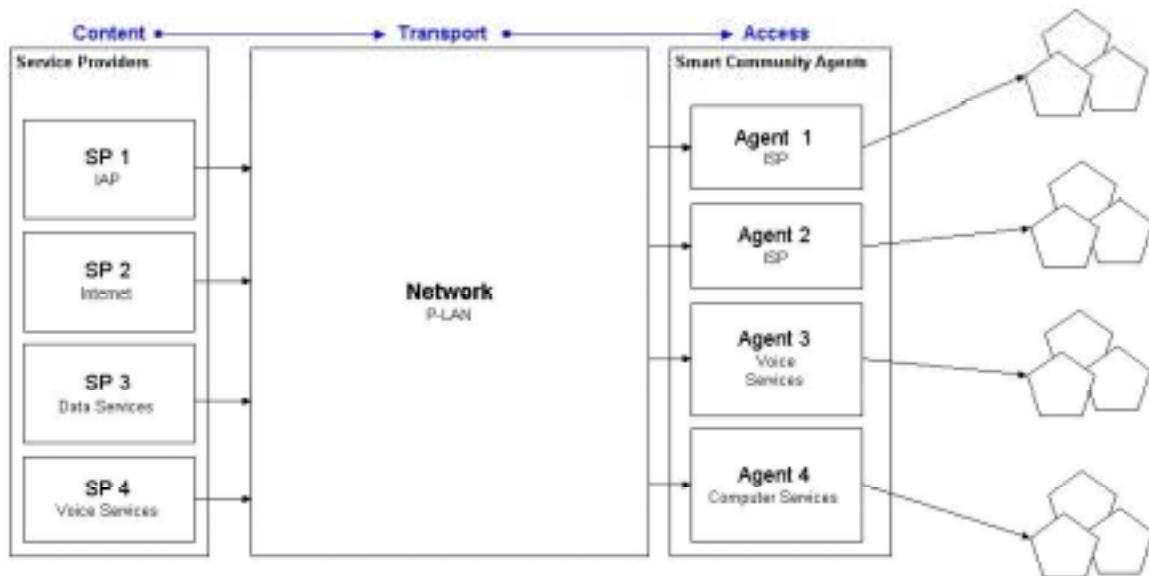
Ultimately it will be the end users who will determine the success of the network. It will be essential for the agents to educate the public on the value of participating in the Smart Community and the P-LAN. A properly designed and executed network will generate a high participation rate from within the community.

As participation climbs, public opinion will be instrumental in driving the project towards 100% participation levels. As each user gains free access to the P-LAN and is given an email address, a website, a white pages listing, etc, friends and neighbours will want to get involved in order to share this new form of communication with them.

4.2 Smart Community Delivery Strategy

A *Smart Community* is made up of many participating businesses, each providing a product or service. This accumulation of products and services is tied together through a central delivery mechanism able to aid communication between participants and improve the quality of delivery. That delivery system is the Public Local area Network, or P-LAN. The main focus of a *Smart Community* is to create an intelligent, connected community in which all participants are successful.

The following diagram shows the delivery strategy for the different components within the *Smart Community*.



4.2.1 Service Providers

A service provider's role is to provide the network with a greater wealth of service options. These service options are delivered to the network at wholesale and then delivered to the *Smart Community* agents at a margin to be sold. Services are branded as *Smart Community* services, under the network provider's name, to give a greater sense of consistency for agent delivery. A call center will be able to offer support on all services offered by the network. If more specialized support is needed service provider knowledge will be on hand.

4.2.2 Smart Community Agents

Deployment of broadband connections will be provided through a network of authorized agents. To gain agent status participating businesses will be required to complete a mandatory training course. This course will provide potential agents with the basic knowledge necessary to sell *Smart Community* services.

Once an agent is certified they will be able to sell connections and the suite of network services. These agents will access their existing customer bases to expand the *Smart Community*. Agents will be given marketing and sales materials, detailing service offerings and available areas for network expansion, to aid in the selling process. As new services become available to the network appropriate *Smart Community* agents will be contacted and training scheduled. Monthly meetings will be held for agents to share their input on new services, delivery processes and co-marketing efforts. A standard commission pricing structure of 100% for the first month and 10% residual will be used across all service offerings. The business market and the available price position of connections should make selling very attractive and easy. Each agent will be directed to a secure area on the network provider's website for customer signup and management. These signups will be processed and, if necessary, queued for future infrastructure expansion.

4.2.2.1 ISP's

Existing ISP's will be approached to first become *Smart Community* customers then *Smart Community* agents. As a customer an ISP can utilize a fiber connection to support its existing customer base. As an agent an ISP can target its business customers with a *Smart Community* connection and yield more revenue and future selling opportunities than with a traditional connection.

4.2.2.2 Telephony Reseller

As telephone services are an essential part of communication, each area will require an agent to supply voice hardware and telephone services. The voice service provider will start off as an agent and provider of legacy telephone systems and technical support and will be given incentives to grow into a next generation provider of IP based hardware and IP based voice services. This agent will also be responsible for deploying IP voice circuits and hardware into businesses once this service is provided by the network.

4.2.2.3 Computer and LAN Reseller

Each *Smart Community* will need a local computer company agent. A computer reseller will be responsible for connecting customers to the network. They may also be required to answer technical questions, configure workstation PC's, corporate LANs and to supply access to the new network. As residences are brought onto the network these agents will also be responsible for installing broadband connections.

4.2.3 Smart Community Benefits

Agents participating in the *Smart Community* gain several distinct benefits.

4.2.3.1 Extra Source of Revenue

All services offered by the *Smart Community* network offer excellent commission levels to participating agents.

4.2.3.2 Co-Marketing

Brochures, newsletters and the community website will spotlight participating agents. This offers exposure to an array of customers far beyond regular business marketing channels.

4.2.3.3 Value Added Services

Agents will have the ability to bring to their existing customer base value added services, thereby increasing the competitive value of both their customer and themselves.

5 Applications For a *Smart Community*

By taking advantage of the convergence of voice and data services *Smart Communities* will come into being. The size and type of community will determine what applications of telecommunications technology it uses. However, from a civic or regional economic perspective we could look at some of the following applications:

5.1 Healthcare

- Remote medical imaging
- Better communication between facilities
- Possibilities for centralized patient databases to improve individual healthcare

5.2 Education

- Multimedia and Interactive Learning
- Adult Education
- Home Learning/Distance Learning
- Curriculum Development/Distribution

5.3 Municipal Network

- Emergency Services
- Shared administrative resources between departments

- Online civic services
- Online payments
- Business to Business Ecommerce with civic suppliers
- High Speed Internet and Data Services
- Integrated billing for all communication services

5.4 Business

- Business to Business Ecommerce
- Business to Consumer Ecommerce
- Local Business to Local Consumer Ecommerce
- IPCentrex
- Voice over IP (VOIP - reduces Long Distance costs)
- High Speed Internet and Data Services
- Integrated billing for all communication services
- Marketing

5.5 Public

- VoIP to reduce Long Distance costs
- High speed Internet access
- Community control over CATV programming (within *Smart Communities*)
- Integrated billing for all communication services
- Online access to services within their own community without having to go out onto the Internet.

6 Community Benefits

“History teaches that a society that does not act promptly and aggressively in the face of a transforming technology risks being overtaken by those that do. We do not have the luxury of standing still. We either assume leadership in using and producing information technology or we sit back and watch our economic base shrivel and our children seek their livelihoods elsewhere.”²

For the town or city that opts to become a *Smart Community* there are many potential benefits. Some of those benefits are:

- Increased attraction for technology based businesses
- Increased attraction for business relocation
- Increased services to constituents at no extra cost
- Increased capital generation
- Increased tax revenues
- Increased disposable income
- Increased number of successful businesses

² <http://www.forks.org/forksinit/mitcreport.pdf>

- Lower telecommunications costs
- Better education
- Ability of local businesses to compete in the new economy
- Youths stay in, or return to, community rather than move elsewhere (employment opportunities and training available without having to leave)

6.1 Bringing the Community Together

An essential part of any *Smart Community* is its entry point to the worldwide network. This point, the P-LANs portal or website, will be the community's focal point through which members will access each other's services as well as the World Wide Web (if they have purchased the necessary connection). Each member of the community that wishes to can have their own presence on the community portal. It is this portal, as the central hub around which the P-LAN is focused and through which the Internet can be reached, that will give the business members of that community an edge over their competition elsewhere in the world and serve as a unifying force in the community.

6.1.1 Community Involvement

Through monthly meetings, agents can offer their opinion on the direction of the network and the services that it offers. This allows relationships to continually grow and benefit. Meetings also help to keep agents aware of new areas set for network expansion. Through website feedback and feedback from Customer Service agents, customers will be able to offer their suggestions for new services and network improvements.

As well, the ability for members of the community to interact with all local businesses and local government via the P-LAN will generate strong involvement in both the network and in the community.

6.1.2 Service Certification

Many of the next generation services offered by the network provider require in depth knowledge and customer involvement. Some of these services will not be offered to all agents. To deliver these products agents can apply to become solution providers for this service. If approved, the network provider will provide in-depth training and setup. Once certified, agents have the right to deliver this service within their community and gather commission from its revenue.

7 Summary

The progression from traditional community to *Smart Community* is essential for the long-term economic growth and stability of most communities today. While it is inevitable that communities will, as technology advances, become "Smart" that progression will be slow, unstructured, incomplete and externally centred rather than community centred. Smart Communities need a nucleus around which they are centred and which provides both the structure and the catalyst for growth. The P-LAN will be that nucleus. By making available low cost ubiquitous high-speed connectivity, by

providing user managed bundled services, by involving a wide range of businesses and governments, and by actively promoting the concept and reality of the *Smart Community*, Next Generation network providers will be the catalyst that brings the Smart Community to fruition.