

The Alberta SuperNet:

An Axia Breakthrough Solution to Removing the Digital Divide



The Alberta SuperNet uses an open access model which creates a competitive environment for service providers who want to deliver ultra-high-speed services to their retail and business customers.

Thanks to the Alberta SuperNet, Albertans now have access to affordable Real Broadband services across the province via the world's best Internet Protocol ("IP"), ubiquitous, ultra-high-speed broadband network.

The Alberta Government had a vision to make affordable global connectivity available to all Albertans regardless of whether they lived in rural or urban areas. Thanks to an innovative solution by Axia, the Government of Alberta has a state-of-the-art IP network that connects 429 communities and provides direct connectivity to 4,200 government, learning, health, library and municipal facilities.

More importantly, the Alberta SuperNet uses an open access model which creates a competitive environment for service providers who want to deliver ultra-high-speed services, including Internet access, to their retail and business customers - especially those who reside in rural areas. Thus, any service provider can buy bandwidth directly from Axia, the operator of the Alberta SuperNet.

Currently, 224 communities now have retail access to high-speed connectivity from 81 service providers who have contracts with Axia to connect to the Alberta SuperNet. Prior to the Alberta SuperNet, Alberta's rural communities only had dial-up access and any hope of IP connectivity was either very cost prohibitive or technically out of reach. This is a remarkable achievement when you consider that prior to Alberta SuperNet, there were only a few high-speed service providers operating outside of the metropolitan centres of Calgary and Edmonton.

Eliminating the Digital Divide – A Global Problem

Governments around the world are recognizing that the long-term economic impact of broadband makes it critical infrastructure for their economies. IP-based connectivity, that overcomes the obstacle of distance and bridges the Digital Divide, will underpin their future economic prosperity, lead to increased standards of living and fuel the development of knowledge economies in both urban and rural communities. Much like how railways and roads were critical infrastructure in the previous century, broadband is widely recognized as the foundation for the new economies of this century.

The old copper legacy networks are quickly becoming the dinosaur of telecommunications, as they do not support the needs of Knowledge Societies. They are part of the problem and are not driven to be a part of the solution. The old copper models are designed for separate voice and TV networks. In North America, cable was also used but interestingly, the rest of the world has not used cable.

Axia saw the limitations of the old model and created a new way of approaching this problem using IP technologies. Axia designed a model that facilitates real competition and creates real choice for consumers. In doing so, it established a unique position for the company in a field where

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traditional incumbents will not compete. In the IP world, everything can be carried on a single powerful fibre optic network. To get to the global gateway, end users only need local access providers at the community level and an independent operator at the regional level.

Axia’s Unique Open Access Model – An Innovative Real Broadband Solution

Axia’s business philosophy is built on the belief that future business opportunities that rely on powerful networks should not be limited to major urban centres as all organizations, companies and individuals can benefit from high-quality, high-capacity, cost-effective connectivity wherever they live or work.

As an “operator of operators,” Axia provides Real Broadband guaranteed connectivity to all service providers, levelling the playing field for both urban and rural customers in a geographic region. This innovative approach to network design and management - equal access to Real Broadband connectivity - challenges traditional telecommunications providers, who have focused on delivering network services to more densely populated areas where they have a large, concentrated customer base and more manageable construction costs. Non-metropolitan areas - especially in terms of the Internet and data connectivity - have lagged behind, limiting business potential and hampering rural and small-town citizens’ access to educational, commercial and social service resources.

Axia’s Real Broadband Open Access Network model delivers network services to large geographic areas and creates major opportunities for business and economic growth. Axia operates as an impartial, expert buyer or manager of network services on behalf of its customers, which ensures that competition results in the best service at the lowest cost for the end user. And because Axia charges a standard rate for bandwidth – with no volume discounts or price breaks for multi-point connectivity – new local network service providers can operate on an equal footing with larger existing providers.

Alberta’s Problem – Eliminating the Digital Divide

In 2001, the Alberta Government had a vision to make global connectivity available to all Albertans regardless of whether they lived in a rural or urban community. Alberta’s rural communities had dial-up access and any hope of IP connectivity was either very cost prohibitive or technically out of reach.

Geographically, Alberta spans 661,185 square kilometres but has a relatively small population of 3.2 million that is mainly located in six metropolitan centres (80% urban and 20% rural). However, the majority of the province’s economic activity (oil and gas, agriculture and forestry) is based in rural Alberta, causing a significant impediment to future economic benefits. Additionally, government networks were isolated from each other and impeded the delivery of electronic government services.

The Government had four simple goals:

- Eliminate the digital divide between rural and urban Albertans;
- Allow Alberta-based enterprises to lead in the development of new IP services for Albertans and beyond;
- Drive Alberta’s future growth and prosperity; and
- Raise the level of government services available to all Albertans.



A snapshot of Alberta

Area: 661,185 square kilometres

Population: 3.3 million

Principal Urban Areas & Population

Edmonton (Capital)	782,101
Calgary	879,277
Red Deer	67,707
Lethbridge	67,374
Fort McMurray	60,983
Medicine Hat	55,724

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The Government of Alberta selected Axia's unique open access model as the means to meet their goals.

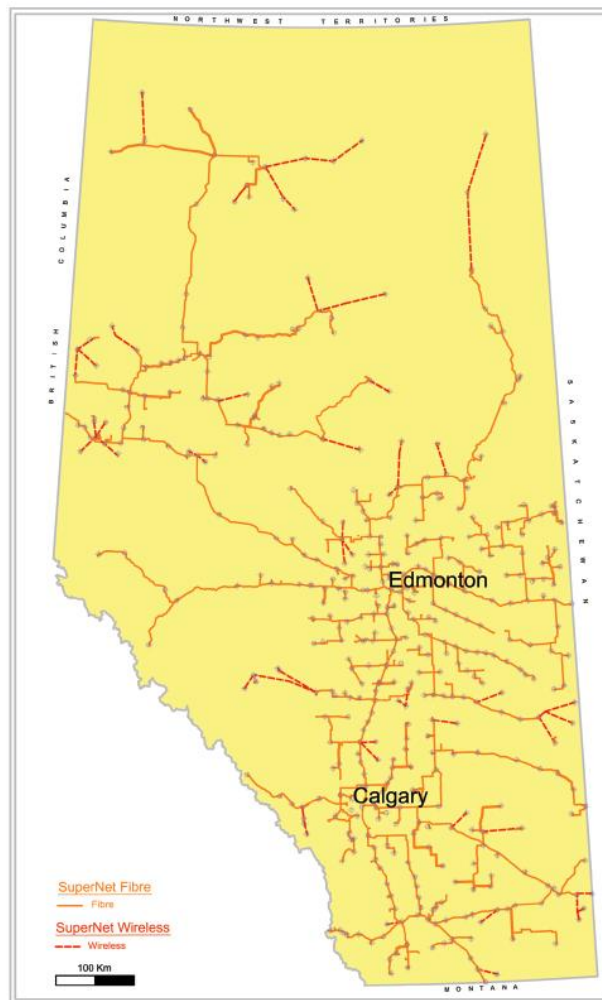
The Alberta SuperNet – An Axia Solution

Axia's flagship example of a Real Broadband solution is the Alberta SuperNet, which provides ultra-high-speed, high-capacity bandwidth to 429 communities province-wide – including direct connectivity to health, education and government services. The SuperNet enables multiple streams of video, audio and data to be delivered on a single powerful network. Axia has a ten-year renewable contract with the Government of Alberta to operate the SuperNet network.

The Alberta SuperNet enables the Alberta Government to benefit from its purchasing power on telecommunications services to: (1) obtain services for its own needs at highly attractive rates; and (2) level the playing field between urban and rural areas for high-speed digital facilities.

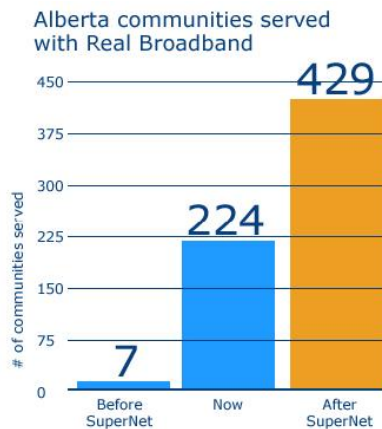
Creating Competition and Supporting a Growing Economy

By adopting Axia's open access model, the Government of Alberta has eliminated the Digital Divide in Alberta and created a new market sector that previously did not exist. The SuperNet has created and fostered a competitive environment for service providers who want to



Enhanced services for government

Government enhanced capped services provide reliable high-speed, bi-directional communications across the province of Alberta. They are available to all Government of Alberta offices, Health, Learning, Library facilities and Municipalities. Axia's IP Layer 3 services support voice, data, interactive data and standard data with industry leading performance guarantees.



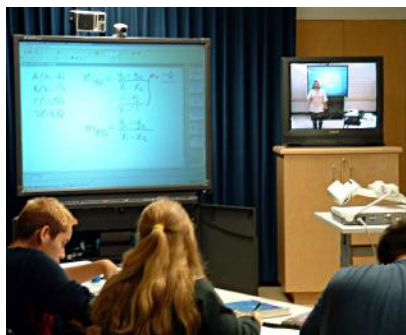
A snapshot of the network

Total length:	13,000 kilometres
Fibre connectivity:	10,900 km (84%)
Wireless connectivity:	2,100 km (16%)
Wireless towers:	83
Locations Connected	
Government:	
Provincial offices	1,335
Municipalities	221
Learning	2,073
Health	421
Library	309
Total	4,359
Communities:	429

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deliver ultra-high-speed service to their retail and business customers. Any service provider can buy Real Broadband bandwidth directly from Axia and as the “operator of operators” Axia cannot compete with service providers by offering last-mile connectivity directly to the retail marketplace. Wholesale rates are benchmarked to metropolitan wholesale rates to ensure competitive pricing for service providers.

Prior to the SuperNet, there were only seven service providers operating outside of Alberta’s two largest metropolitan centres. There are now 81 service providers who have contracts with Axia to connect to the SuperNet. There are approximately 500 service connections and 224 communities that have retail access to high-speed connectivity. Currently, 80 percent of Alberta residents now have the option to access to high-speed Internet options. Once service providers have a presence in all SuperNet communities, 95 percent of Alberta residents will have access to high-speed Internet options.



Leading the world in education

Teachers can now offer specialized courses such as mathematics and physics to students in remote communities using videoconferencing and interactive whiteboards.

The Growing Impact of SuperNet Benefits Albertans

The positive impact of the SuperNet is being demonstrated daily as the use of this powerful network is growing daily.

Learning

- Alberta is becoming a world leader in distance learning because of the SuperNet. Guaranteed throughput and connectivity enables engaging, real-time, two-way communications.

Teachers can now offer specialized courses such as mathematics and physics to students in remote communities using videoconferencing and interactive whiteboards. As well, classes can connect to world-renowned institutions (such as Alberta’s Royal Tyrrell Museum) provincially and globally, letting students interact with leading experts in various scientific, artistic and cultural fields.



SuperNet links students and teachers in remote communities to peers and learning resources.

- The Northern Alberta Institute of Technology allows welder and electrician apprentices based in regional communities to take classes through videoconferencing. This allows for two-way, real-time interaction with a teacher in Edmonton. Students receive a digital copy of the class for review. Instructors then use mobile classrooms to provide hands-on training in area communities.

- Students in ten Alberta schools shared stories about their culture and life in Alberta with visitors to the Smithsonian Folklife Festival in Washington, D.C. in June and July 2006. SuperNet-enabled videoconferencing links were part of an Alberta showcase at the festival.

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- eCampus Alberta has 15 post-secondary institutions across the province providing students with access to online courses via the SuperNet. Each of the institutions develops their own courses and shares them with each other.
- The Regional Council of the Lesser Slave Lake First Nation has extended SuperNet benefits by providing high-speed Internet access to communities, creating a SKILLS inventory database that provides information on services to First Nation reserves; sharing health information and exploring the possibility of linking up water treatment plants to industry.
- Elementary school children in Millarville and Lethbridge collaborated online to share results from an archeology project and compare local history and artifacts. The teachers involved won the 2005 Governor General’s Award for Excellence in Teaching Canadian History – Canada’s top teaching prize.

Health

- SuperNet is being used for orthopedic consults between doctors in Rocky Mountain House and specialists in Red Deer. Physicians view and discuss X-rays online in real time.
- Speech therapists in Edmonton now work with students in Ashmont, west of St. Paul, in twice weekly “virtual visits.” Prior to the SuperNet, students only had one session per month with their speech therapist. The SuperNet also allows the therapist to coach an onsite assistant.
- The Government of Alberta is currently working on a major initiative to electronically link patient health records for province-wide access.

Libraries

- All libraries (more than 300) in the province have SuperNet connectivity allowing them to support learning and community-based programs.
- SuperNet connectivity is re-vitalizing the role of the rural library into a focal point for community activities.
- University of Calgary students can now use computers at any Calgary public library branch to access online university resources that used to be available only on-campus.
- Albertans can request books from any library in the province be sent to their local branch. The process used to take up to several weeks - with SuperNet, the turnover is three days.

Economic Development

- New, locally based service providers are emerging from the competitive local access market created by the SuperNet.
- Local Internet service providers are creating partnerships with local cable TV societies to offer high-speed Internet in communities that previously only had dial-up.



Creating economic opportunity

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Rural government offices now have rapid access to the same information and resources previously available only in larger centres.

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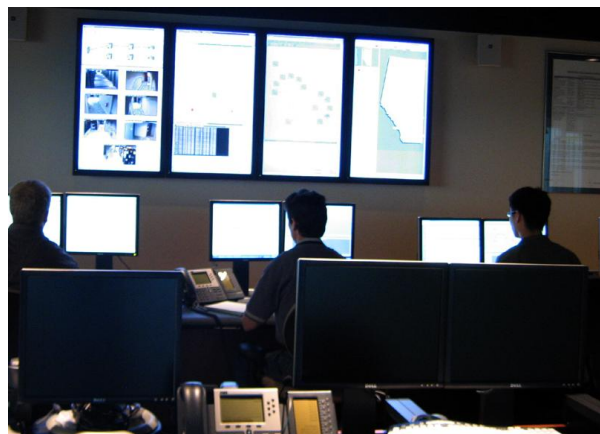
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- Sunterra Farms’ clients in Japan will be able to “follow” their product via videoconferencing through the meat-processing process. Sunterra is now able to have weekly management meetings over the SuperNet that was not practical due to long travel requirements to have face-to-face meetings.

Government

- Using the SuperNet, videoconferencing has linked 53 provincial courts with correctional facilities, reducing the number of prisoner transfers and increasing the efficiency of court processes. Victims and witnesses are now able to appear from a location nearer to their home. As well, many victims, especially children, are unwilling or unable to testify if they must face the accused in person. With videoconferencing technology, victims can participate from a safe location.

- Rural government offices can now transfer large data files including engineering documents and maps electronically rather than mailing them. Additionally, previously some online accounting tasks could take all day but with SuperNet they can now be completed in less than three hours.



Network performance specifications

Network availability: 99.925 %

Performance statistics:

Latency (round trip) < 50ms
 Jitter < 20ms
 Packet loss < 0.5 %

The Alberta SuperNet – Network Components

The Point of Presence (PoP) in each SuperNet community is the demarcation point for all government service sector customers in or near the town. As well, service providers who use SuperNet to reach communities co-locate their equipment here, linking their SuperNet connection to the last-mile network leading to their retail customers.

Network components

Number of Points of Presence: 444

(PoPs; community demarcation points, Meet-Me Facilities, aggregation points)

The SuperNet is designed to comfortably accommodate future bandwidth needs.

Network Operations Centre

Traffic on the SuperNet is monitored by Axia 24 hours a day, seven days a week from its Network Operations Centre (NOC). Highly trained network analysts use sophisticated hardware and applications to ensure data moves quickly, efficiently and securely. Axia’s NOC team also provides ongoing operational support of the Alberta SuperNet in the following areas:

- NOC – Network Monitoring, Fault Management, Security Monitoring, Performance Monitoring
- Customer Care – Network Configuration, Customer Billing, Service Development, Stimulate Customer Demand
- Network Engineering – Risk Assessment, Strategic Planning, Engineering, Network Growth Management/Sustainability.

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