

**BCL Overview  
October 2003**



**BCL delivers high quality, customised communication solutions for broadcasters and telecommunications retailers, and other communication providers.**

BCL is the most experienced wireless solutions partner to the New Zealand communications industry.

Our network was originally developed to meet the demanding coverage and reliability requirements of broadcast TV and radio. Over the years we have consistently provided high quality, customised communication solutions with well-engineered, well-managed facilities.

We are New Zealand based - our broadcast network provides coverage to more than 99.8% of New Zealanders - but we also have many international customers who have come to rely on the effectiveness, practicality and knowledge of our engineers.

Today our robust networks provide complete solutions for both telecommunications and broadcast network operators and to a variety of other communication system providers. BCL was the first telecommunications provider in New Zealand to achieve ISO 9001 accreditation.



We specialise in delivering total solutions for broadcast and telecommunications companies. We have a highly skilled and experienced engineering team.



## History

BCL has been providing broadcast and telecommunications solutions to New Zealand and international customers for more than 60 years. We have a unique heritage building expertise in RF engineering and a robust nation-wide network.

BCL has been instrumental in rolling out or developing the following:

- BCL EXTEND broadband wireless network providing broadband data and voice services to provincial and rural New Zealand
- TVNZ, TV3, Prime Television and Sky Television, TAB, the national FM Networks.
- Network linking and a fibre optic network for start-up telecommunications company CLEAR Communications (now TelstraClear)
- Establishment of the Maritime Operations Centre for the Maritime Safety Authority
- Trunked mobile radio operations for TeamTalk, with site installations, maintenance and linking services.
- National cellular network for Vodafone

## Our Network

BCL has one of the largest communications networks in New Zealand. Our services reach 99.8% of New Zealand's population, using more than 400 transmission sites throughout the country.

We've been broadcasting to New Zealanders for more than 60 years, making us the most experienced wireless communications provider in the country. These years of success have given us industry-leading expertise in RF engineering, an unmatched infrastructure of high sites and a wide range of spectrum availability.

BCL's sites can be found in all corners of New Zealand and our linking network has high capacity and full reliability to not only the main centres, but also areas such as Gisborne, Taranaki, Far North, West Coast and many more.

## A Wholesale Business Model in Telecommunications



BCL's telecommunications business model is based on the factors that ensure successful, competitive broadcasting markets in New Zealand. This is promotion of economic use of infrastructure while enabling competition at the service level. Providing a platform that supports multiple broadcasters on both Television and Radio, allows our customers to focus on their core business – content.

Taking this model into the telecommunications market will greatly improve the competitive nature of that market, while extending the reach of telecommunications services in New Zealand in the most cost effective manner.

BCL already provides services to most New Zealand telecommunications organisations by carrying their traffic around New Zealand on our national linking network.

### **Ownership**

BCL is a 100% owned subsidiary of TVNZ. Prior to 31 December 2003 it is expected that BCL will become a subsidiary of a newly formed SOE, Transmission Holdings Limited (THL).

### **Executives**

Managing Director - Geoff Lawson

Manager, Business Development - Alan Thompson

General Manager, Strategic Technologies - John Gibbs

General Manager, Sales & Marketing - Julia Dol

Chief Financial Officer - Ian Widdowson

General Manager, Design & Build - Merv Kelly

Manager, Human Resources - Russell Bell.

## **Services**

BCL specialises in delivering total solutions for broadcast and telecommunications companies. We provide a full range of communication network and systems services including:

### Broadband Services

- Data and Voice Access Services (BCL EXTEND)
- Carrier Class Circuits
- IP & Ethernet Network

### Broadcast Services

- VHF & UHF Television Transmission Services
- FM Radio Transmission Services
- Broadcast Linking
- UHF Communication Transmission Services

### Co-location Services

- Managed turnkey site co-location

### Infrastructure Support

- Operations and Maintenance
- Network Monitoring and Surveillance

### Professional Services

- Design
- Build
- Maritime Operations Centre

### Events and Conferencing

- Itinerant Linking

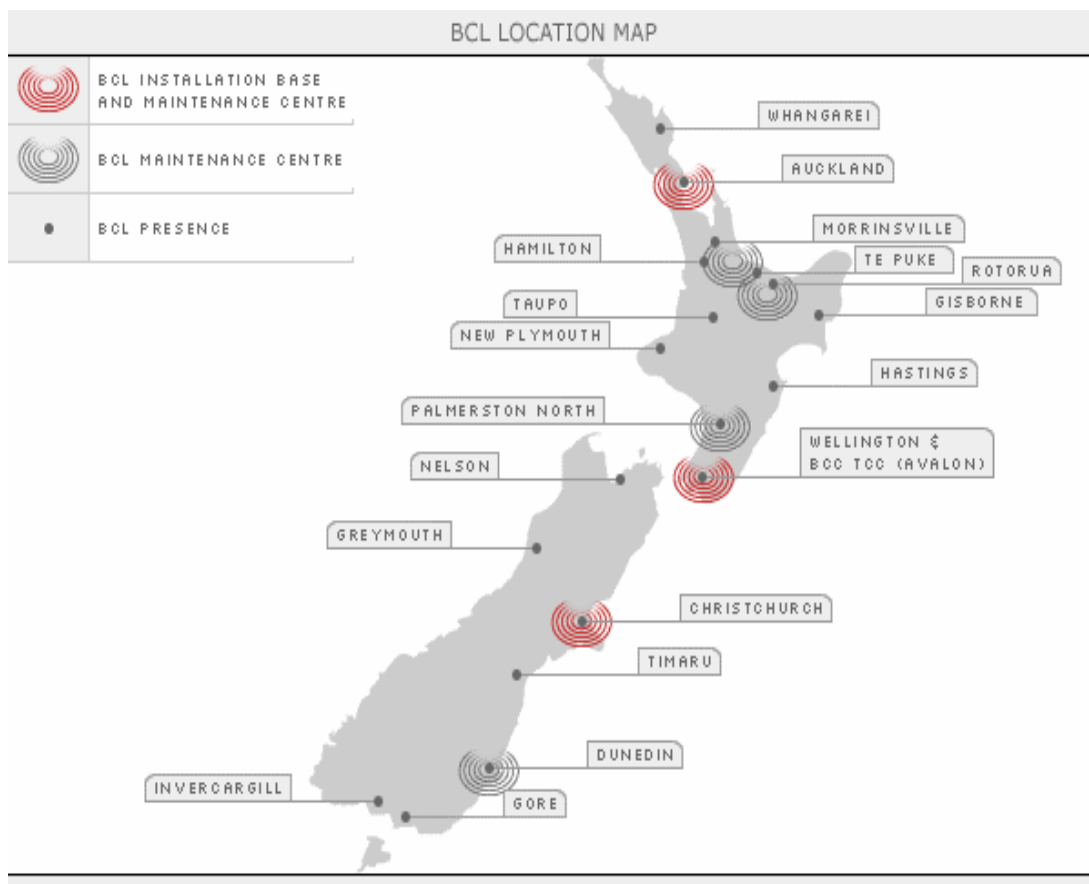


### Staff numbers

BCL employs over 300 staff nationwide.

### Locations

BCL has offices in Auckland, Wellington and Christchurch as well as many maintenance and resources centres throughout the country.



## **BCL's EXTEND (Wholesale Wireless Access) Services**

### **Service Overview**

BCL is an open access wholesale telecommunications provider, which means that BCL will only provide services through retail communications providers and will not supply services directly to the end user.

The wholesale model means that BCL is able to leverage its strategic assets – like its high sites, skills and resources - to provide economies of scale, the benefits of which are made available to all service providers. This means that the end customer gets the benefit of lower costs and better service through competition at the retail level. The nature of BCL's network means that we are well placed to service the regional and rural communities of New Zealand and in fact we have made these areas our primary area of focus.

The EXTEND Broadband Wireless Access range of products have been developed to allow retail communications providers to:

- Service rural/provincial demand by offering broadband solutions in areas currently not covered by fixed access products like ADSL
- Provide an alternative competitive solution to fixed line services
- Provide coverage in areas not otherwise commercially viable
- Leverage their own strengths such as service, applications and support to provide a compelling solution to the end customer.

### **Benefits**

Key advantages of BCL's wholesale approach are that it sponsors competition by making the same leading edge technology available to a number of service providers on an equal footing. Customers are free to choose whom they will take service from based on the value the retail provider can add, rather than merely on who can provide

them service. Smaller retail providers are able to provide a service offering that leverages their competitive advantages at the retail and service level.

The EXTEND service can be transparently provided by BCL so that it appears that service is provided by the retailer. This enables the retail provider to maintain the customer relationship and to provide further value added services.

The services provided are high quality so that you can be assured customers are getting the best possible service and that any Service Level Agreements can be supported.

Both BCL and Airspan can demonstrate ongoing product development roadmaps to ensure that the service keeps pace with technology advancements.

### **Retail Providers Deliver the Services to the End Users**

BCL will provide wholesale access services to the retail service provider. The retail provider is then able to set their own pricing, add their own services, package and market these services under their own brand to the end user. The retail provider is therefore responsible for: billing the end user, the provision of first level customer support, branding and selling the services to the end user, as well as the production of end user support material such as brochures and customer contracts etc. BCL will provide the core service information to enable the retailer to repackage this in an appropriate manner for their customers.

The following are examples of the types of services the retail provider will be able to offer to their customers (end-users):

- Voice (PSTN Equivalent and VoIP)
- High Speed Internet Connectivity
- E-mail services
- Corporate Network Servers (VPN services)
- Inter-branch WAN connectivity
- Web-hosting, ASP and data-centre services

The retail provider is able to use the basic EXTEND building blocks to either provide retail or consumer style volume services to their customers or to craft higher value customised solutions that leverage their own unique expertise to establish a more differentiated position in the market.

### **Service Description**

The EXTEND product set has been developed to provide:

- An 'always-on' secure private wireless network from the retail provider to the end user
- A high-speed wireless connection to the network offering a range of contention based grades of data service with a minimum 128 kbps
- A PSTN equivalent voice quality service
- VoIP capable allowing the RSP to deliver VoIP services via EXTEND (subject to appropriate matching of traffic and service class)
- Fully integrated network services management
- On-premise service implementation as required
- The capability to provide 802.11b wireless services within the coverage area of the end user STU (Service Terminating Unit) i.e. for wireless hotspot or line of sight roaming.

### **Data Service Features**

EXTEND provides fully transparent data services that offer high throughput low delay data network services.

- EXTEND 256 – suitable for small business and residential customers for voice and high speed Internet.
- EXTEND 512 – suitable for business and residential with higher capacity requirements.
- EXTEND 512 plus – suitable for customers that require higher service level data applications such as Voice over Internet Protocol and Video Conferencing.

## Voice Service Features

EXTEND is designed to meet all the basic requirements of 'wired' telephony, meaning the service offered is equivalent to that of the wired network (performance may exceed that of the wired network for some rural customers).

Capability	EXTEND
Support DTMF telephones via RJ-11 interface	Yes
Transparent to local exchange ringing, cadences and tones	Yes
Calling Line ID Services	Yes
Group 3 and Super G3 Fax (28.8k), codec dependent	Yes
Voice Coding Schemes Supported	64k PCM, 32k ADPCM
Battery Backup Option	Yes (8 hours)
Traffic Capacity per RF Interface (with additional data capacity)	Up to 29 Erlangs per RF
Typical Radio Link Reliability	> 99.99%
Ringing Number Equivalence	4.0 per RJ-11 port
Maximum telephone line length from RJ-11 interface	At least 500 metres
System MTBF figure	Target 10+ years
Support for Priority & Emergency Calls (111)	Yes

- Two circuit switched voice ports per STU standard (up to 4 can be provided)
- 150 mE per line – other traffic profiles available. Minute caps will be provided to capture additional revenue once the caps are exceeded.
- 14.4k bps dial-up modem support to an ISP
- Low delay (10msec across Airspan radio access)
- G3 Fax support
- Transparency to RSP voice VAS (“Telecom SPOT”) services
- Line tests can be carried out (similar to wire line)
- Voice service is maintained even with power failure (8 hours) as an option



## **The Customer Connection**

A radio antenna is installed at a location on the customer's property where a Line of Sight ('LOS') radio path and acceptable signal strength can be established from a transmitter at a local high site. Antenna location and installation is comparable with typical UHF television antenna installations.

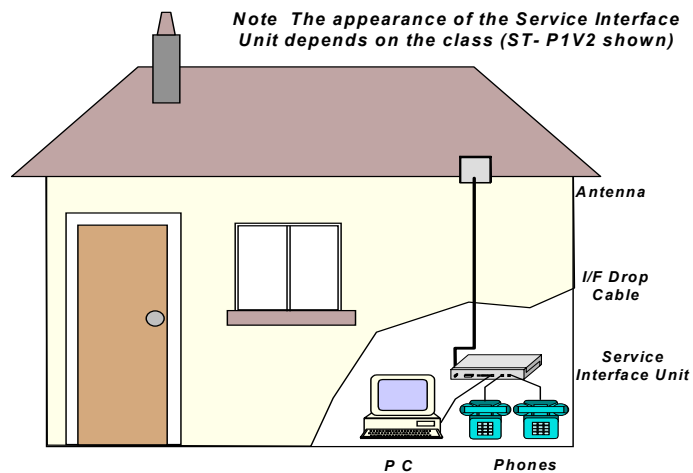
Inside the customer premises, a small Service Terminating Unit (STU) is installed and connected to the antenna by coaxial cable or twisted pair, allowing the antenna and SIU to be up to 70 metres apart, thereby minimising the effect of local clutter at the customer site.

The STU is then connected to the customer's PC, which completes the system. The PC needs to include an Ethernet interface card to connect to this service (this can be installed if required).

The customer STU is transparent to IP protocols thereby allowing maximum flexibility in the IP service delivery. Data segmentation is provided over the network via VLANs (one per customer). This architecture allows H.323, SIP and similar protocols to transparently pass through the network.

Where BCL provides network equipment at the customer premises, all such equipment will meet the requirements of AS/NZ 3260.

## Typical Customer Installation



The SIU with drop and power cables

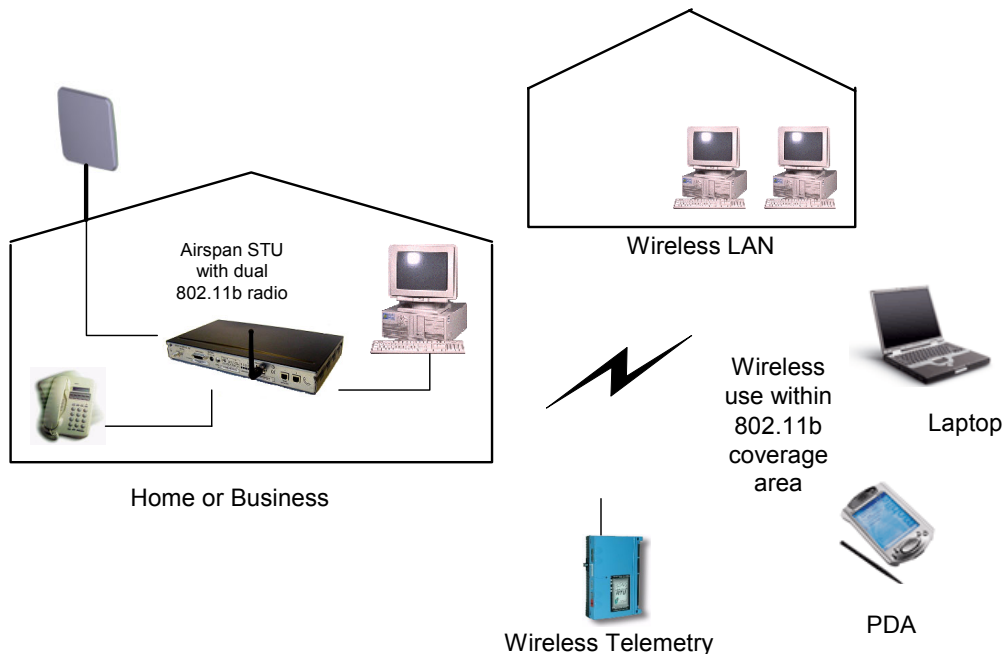


## Optional 802.11b from the customer STU

EXTEND offers the option (under development) of Integrated Wi-Fi (802.11b) Access Point Technology with the Subscriber Terminating Units (STU).

This enables the rapid deployment of Wi-Fi Hotspots and Wireless Local Area Networking at the customers' home, farm or business. The wireless nature of this minimises data network cabling requirements and costs - opening up the opportunity for a number of new business or service options; e.g. on-farm roaming for farmers and their suppliers, support of supply chain, telemetry and security applications, or wireless LAN applications.

## 802.11b Application Example



## Interface to the Retail Service Provider

BCL's existing core network will deliver the network data traffic to a number of points of interface around New Zealand. The EXTEND network consists of an Ethernet core and broadband wireless infrastructure. As a wholesale provider BCL chose an Ethernet core to provide maximum transparency and flexibility between the end user and the retail service provider. A key feature of this network is the ability to prioritise and shape traffic to provide guaranteed Quality of Service (QoS).

This Ethernet platform is transported over a protected high capacity nationwide SDH based Fibre and Digital Microwave Radio (DMR) network.

The EXTEND service will provide an 'always on' Ethernet connection to users that is controlled centrally. The network architecture allows for Virtual Local Area Networks (VLANs) to securely separate end user traffic. Ethernet data will be presented on 100BaseT 802.1Q tagged VLAN ports.

## Service Level Targets

### Service Availability Targets

POI to end user STU	99.95% Annual Averaged across all users
Single Base Station	99.91% Annual Average

### Standard Performance Targets

Service Attribute	Attribute Definition	Service Target
Service Reception	Answering a telephone call from a customer to log a fault or to request other details relevant to the service	<p>Service Restoration: Incoming calls answered 24 hours a day, every day, 80% within 30 seconds.</p> <p>Provisioning Queries: Incoming calls answered on Business days, 0800 to 1700, within 30 seconds.</p> <p>Billing Queries: Direct to BCL Finance team on Business Days, 0900-1700</p>
Normal Business Hours	Those hours during which Provisioning or MAC requests can be made to BCL via the Account Manager.	0800 – 1700, Business Days
Service Restoration Targets	The elapsed time between the service provider reporting a fault to BCL and confirmation to the customer that the service has been restored.	6 clock hours
Progress Updates	Updates on the status of service restoration activity.	<p>Provided on a significant event basis and includes:</p> <p>If the problem will take &gt; 4 hours to resolve</p> <p>When the problem is resolved</p>
Provisioning/ Change Request Target	The standard time between the confirmed acceptance of a Provisioning/Change request and the implementation of that request.	<p>Activation 15 working days</p> <p>Deactivation 24 hours</p> <p>Change 15 Working days</p>

### **Geographical Limitations**

The quoted service levels apply from the base station out to typically 50kms. These service levels are generally exceeded closer to the base station.

### **Quality of Service (QoS)**

Broadband wireless access supports QoS in the following ways:

- A per subscriber Design Speed
- A per subscriber MIR (Maximum Information Rate)
- A minimum per RF access channel allocation of network resource, and
- The Airspan products and the BCL Ethernet network have the ability to prioritise traffic to support additional classes of service.

### **IP Addressing**

The EXTEND service is transparent to IP Addressing and therefore can transport either static or dynamic IP addressing as required for the chosen service.

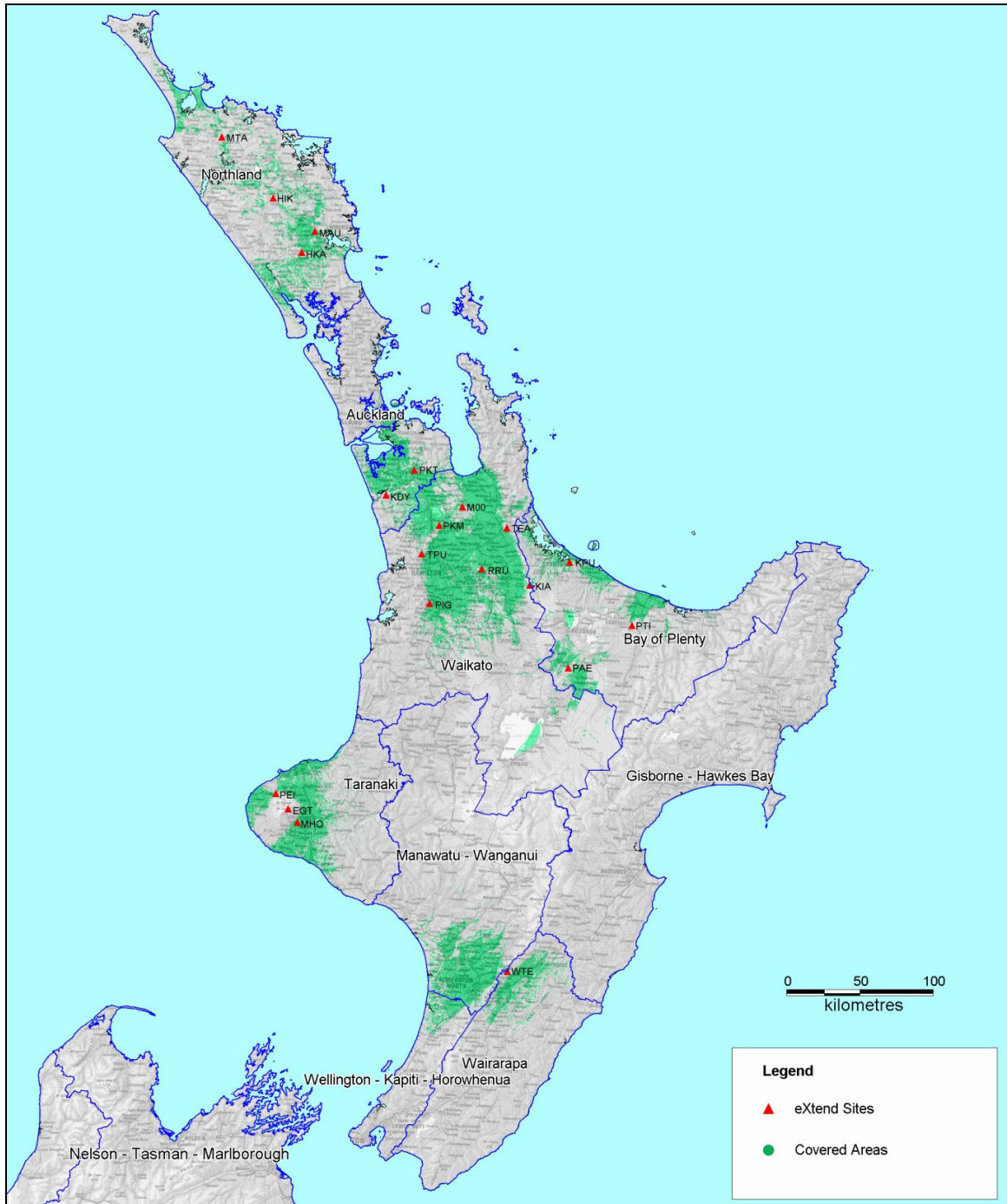
### **Authentication**

All data will be coded using a proprietary Direct Sequence Code Division Multiple Access (DS-CDMA) Air Interface.

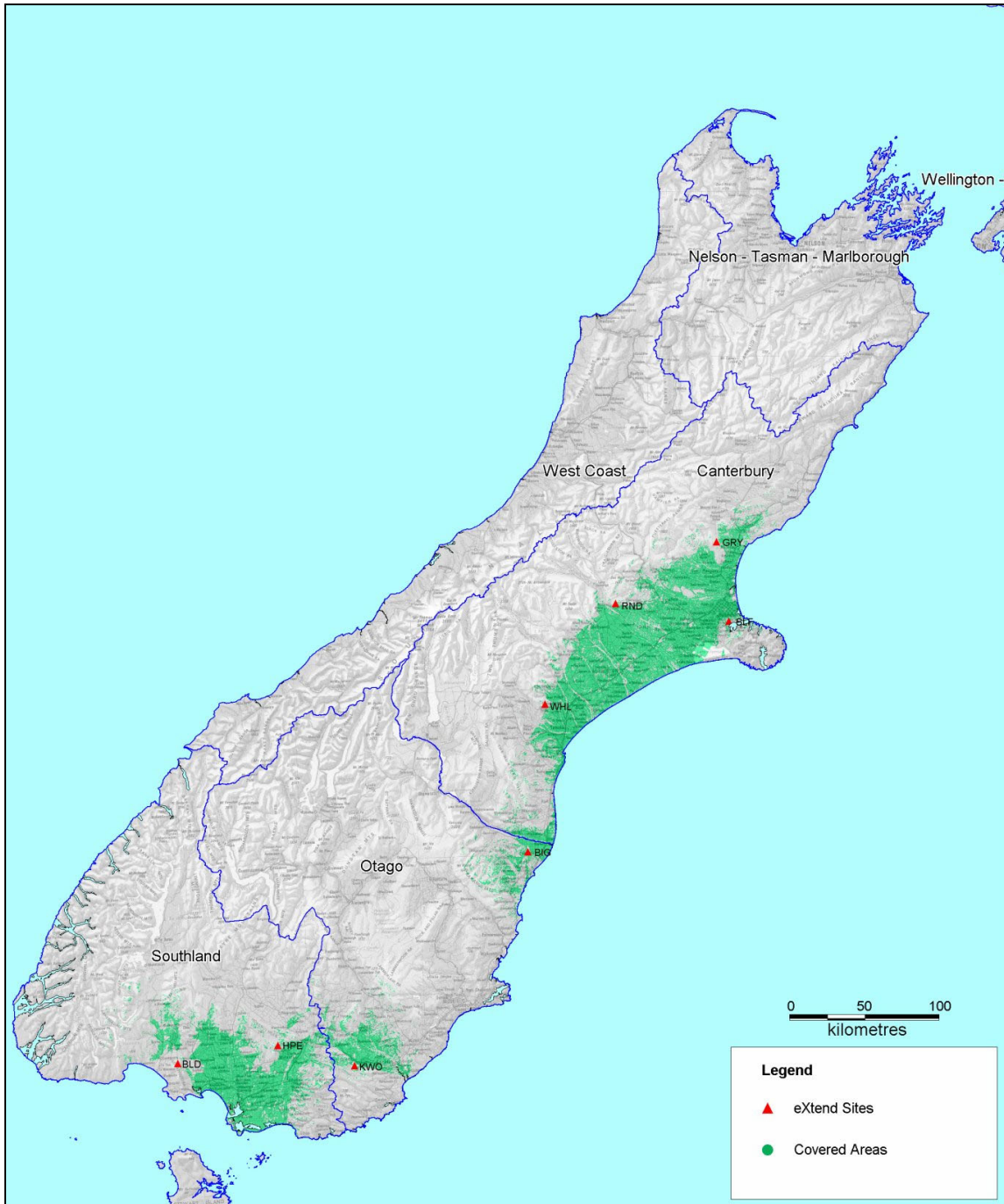
In the system level authentication process, an electronic serial number in the end user STU maps with the STU ID number to authenticate the STU with the central terminal at the base station. The authentication process uses a proprietary encoding format running on separate management channels not accessible to the end user.

No two end users on the network shall be addressable or able to observe each other's traffic, such connection being via the RSP's network.

Coverage - North Island Phase 1 Indicative Coverage



Coverage - South Island Phase 1 Indicative Coverage



## **Carrier Class Circuits**

BCL currently owns and operates a large, high performance, high reliability, digital microwave radio (DMR) network comprising both high capacity and medium capacity systems and support infrastructure.

The high capacity DMR network extends from Northland to Southland, including access links to the main cities and reaches into many provincial and rural areas as well. On this network, BCL offers a range of services to Broadcast and Telecommunications customers.

The DMR Network is complemented by protected dual route Fibre Optic capacity between Auckland, Wellington and Christchurch, and a single route protected Fibre Optic system provides capacity to Dunedin. The Fibre systems also pass through several provincial centres along the way.

The DMR and Fibre Optic systems are combined to form BCL's 'High Capacity Network' or "HCN". BCL sites, systems, infrastructure, and HCN, enable BCL to supply a range of services to the Broadcast and Telecommunications sectors

### **Bi-directional**

All the Carrier Class Circuit products are two way (bi-directional) products. Essentially these products are simply point-to-point circuits, equipped to different speeds, and different interfaces, to meet to suit our customer's requirements.

### **Service Levels**

Depending on the requirements of the customer, and the use of access links and/or HCN transmission capacity, the Service Level Agreement (SLA) can be high or relaxed.

The SLA describes the responsibilities of the customer and BCL, and defines the availability and performance levels of the service. It also describes what happens should the service fail. For some services very stringent or high SLA conditions may be applied. Other special conditions are also noted in the SLA.



### **Technology**

BCL can provide these Carrier Class Circuit products using several different and complementary technologies or platforms. These include the utilisation of BCL's Digital Microwave Radio (DMR) and Fibre Optic based HCN, free space optical links, dark fibre, leased third party capacity, and Satellite systems.

### **End-to-end Managed Service**

To deliver the most efficient circuit solutions BCL can offer fully managed end-to-end circuits

### **Network independence**

Although parts of the Fibre Optic systems use shared equipment – with TelstraClear – and some of the fibre routes (ducts and cables) are shared with other Operators, BCL's DMR network is totally independent of all other carriers.

