

Internet Access in the Powell River Regional District

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Introduction & Scope

Like many rural districts in British Columbia, the Powell River Regional District encompasses a variety of communities and service levels. Within the city of Powell River, residents can choose a lifestyle that is substantially urban. Farther afield, homes exist completely off the grid, beyond reach of conventional power, telephone or even road access. Other residents find a rural/urban balance in communities and neighbourhoods throughout the district. This ability to find one's own balance is cited as a leading attraction of the area¹, and is attributable in part to the variety of the region.

No matter where residents chose to live, all share an increasing interest in broadband (high-speed) Internet access. Broadband first arrived in the region about 10 years ago², but service gaps remain. The Powell River Regional District (PRRD) has commissioned this report to examine the state of broadband connectivity in the region, identify gaps and suggest solutions for extending service. Gaps may be a simple lack of coverage, or a prohibitive subscription cost. The report was researched and completed during November 2009.

¹ *Big Pacific*, "The Powell River Lifestyle" • www.thesunshinecoast.com/about/lifestyle.html

² When Shaw Cablesystems first offered "Shaw@Home" high speed service

Definitions

When preparing a report on technology, it is perhaps inevitable that we encounter acronyms and other technical jargon. In the interests of accessibility, this report has been written in a way that de-emphasizes such terms, making them optional. Terminology is still included for technical accuracy, but there is no requirement to understand it in order to understand what follows.

One term is important to define: For the purposes of this report, “broadband” refers to any type of Internet access that operates at 1.5 Mbps (Megabits per second) or faster³. This measure of speed is becoming the accepted definition of broadband in Canada, as expressed by the Federal Government⁴. In contrast, dial-up phone modems are usually rated at 56 Kbps (Kilobits per second). Since 1 Megabit = 1000 Kilobits⁵, a dial-up modem is at least 27 times slower than broadband. Broadband does not refer to any one technology, but merely to a *minimum speed limit*, which we are fixing at 1.5 Mbps.

It is worth noting that most broadband providers sell light or basic packages that fall below this speed. These packages are still significantly faster than dial-up, but slower than broadband as defined above. In the interest of clarity, these packages will be referred to as medium speed.

Background

To better understand the expectations of residents who lack affordable broadband access, it is important to illustrate how Internet use has changed over the years. Innovation in dial-up modems ended in 1999, and the intervening decade has obsolesced this technology. Since then, personal computers have increased in speed by more than 1500%⁶. Broadband access has become almost universal, so that today 94% of Canadian households are within reach of high-speed Internet. And uptake has been very good — approximately 69% of Canadian homes currently subscribe to

³ Minimum 1.5 Mbps download, 384 Kbps upload. Almost all Internet access is balanced in favour of download speed.

⁴ *Broadband Canada: Connecting Rural Canadians* • www.ic.gc.ca/eic/site/719.nsf/eng/h_00004.html

⁵ *Prefixes for binary multiples* • www.physics.nist.gov/cuu/Units/binary.html

⁶ Based on benchmarks a common mid-to-high end personal computer in 1999, vs. benchmarks for equivalent computers in 2009. An Intel Pentium III scored 247, vs. 4175 for the Intel Core i5. *PassMark Software* • www.cpubenchmark.net .

broadband⁷. The fastest consumer broadband available in Powell River today is 25 Mbps⁸, about 446 times faster than dial-up⁹.

As these trends continue around the world, Internet content has largely become broadband-enhanced. Modern websites do not download quickly over dial-up modems, and even email has become slow. Many popular Internet services (such as YouTube, Google Earth and Skype¹⁰) are designed specifically for broadband, and fail to operate properly on a dial-up connection. Important operating system updates are too large to download at all. Interesting multimedia features of the Internet, such as streaming video and virtual tours, are not available to the dial-up user, and services that rely on a constant Internet connection also suffer or fail. In a very real sense, the dial-up user has become a second-class citizen of the Internet, unable to participate in services which are increasingly popular and important in our lives.

With the majority of Canadians using broadband both at home and in the office, there is an increasing perception that high-speed access is available to everyone. This creates a further barrier for non-broadband users, as they are expected to participate online in a way that for them is not possible. Examples of this include friends sending large email attachments (overwhelming dial-up email), companies expecting employees to tele-commute or otherwise collaborate from home, and organizations publishing information in an exclusively broadband context, so that dial-up users are effectively cut out. In today's world, dial-up service is still better than no service at all, but only barely. As a connectivity option it is just too slow, and will be treated as such in this report.

⁷ *CRTC Communications Monitoring Report, 2009.*

⁸ Shaw offers wired high speed access up to 25 Mbps, 446.4 times faster than dial-up. Bell & Telus offer wireless coverage near to this speed, at 21.1 Mbps. All three options debuted in the area this year.

⁹ The speed of all types of Internet access can be affected by conditions, so accounts tend to be marketed using optimal or best possible figures. As this practice is widespread, speeds are still very useful for comparison.

¹⁰ All trademarks are the property of their respective holders, and are used for illustrative purposes only.

Internet Service Providers Today

The PRRD is served by nine Internet service providers¹¹, through a variety of wired and wireless technologies. A summary of these providers is included here, along with some basic¹² comparisons in speed (more dots is faster), distribution, and cost. Some providers offer a variety of account speeds, which are listed here as a range.

Provider Name	Technology	Relative Speed	Distribution	Relative Cost
Bell	Wireless Cellular	•••••	Good	Medium
GBIS/LIAS	Wireless Radio	•••	Limited	Low
MasterOne	Wireless Radio	•••	Very Limited	Low
Rogers	Wireless Cellular	•••••	Good	Medium
Shaw	Wired Cable	•• to •••••	Good	Low to Medium
Telus	Wired ADSL	•• to •••••	Fair	Low
Telus	Wired Dial-Up	•	Excellent	Low
Telus (Mobility)	Wireless Cellular	•••••	Good	Medium
Twincomm	Wireless Radio	•••	Limited	Low
Uniserve	Wired ADSL	••• to •••••	Good	Low
Xplornet	Wireless Radio	•• to •••••	Excellent	Medium to High

Figure 1: Summary of Powell River Internet Service Providers (more dots is faster)

Recent Developments

The market for local Internet service is far from stagnant. Recent changes that affected the Powell River region are listed below.

2008: Gillies Bay Internet Society (GBIS) brings affordable broadband Internet to the Gillies Bay region, through an innovative partnership with the Lasqueti Internet Access Society (LIAS).

2009: Shaw introduces *High-Speed Warp*, extending its lead as the fastest Internet service provider in the PRRD. At 25 Mbps, speed is incredible; coverage favours the city of Powell River and a few kilometres beyond.

2009, October: A local committee is formed to facilitate improved Internet access in Electoral Areas A & C, the two areas most underserved at the

¹¹ A full listing of Internet Service Providers (with typical subscription costs) appears in Appendix A

¹² This report is not intended as a comprehensive review of regional Internet service providers. Comparison data is based on publicly available information and marketing, checked against real-world network testing, local end-user reports, and our own experiences in the field.

moment¹³. Close to 40 people attended the inaugural meeting at the Lund Community Centre, including key representatives of the regional district¹⁴. This committee is in the formative stages of growth, and hopes to add Area C residents to its board of directors. Committee members are keenly aware of local issues, and the creation of this group is expected to streamline resident efforts and improve communication. An Internet discussion group is open¹⁵ and drawing interest from the public.

2009, October: Xplornet buys capacity in the next-generation Jupiter Satellite System, set to launch in 2012. The new satellites will provide home connectivity speeds 8 times faster than current offerings¹⁶.

2009, November: Bell & Telus launch a next-generation cellular Internet service, tripling cellular data speed to 21.1 Mbps in the area. The new HSPA+¹⁷ network spans over a million square kilometres, reaching 93% of Canadians¹⁸. Local testing for this report confirmed excellent speed and reasonable coverage. This marks a potential tipping point, where wireless access is almost faster than the fastest wired service in the area¹⁹; coverage is already superior. Network competitor Rogers has HSPA+ service in major Canadian cities, and plans on expanding that service in the future.

2009, ongoing: Work is proceeding on a new GBIS transmission tower on Mt. Pocahontas, its third on Texada Island. The tower will increase coverage and reliability for island residents. Funding was secured through provincial grants.

In addition, most services have increased in speed during the past 2 years, while prices have remained the same or declined. This “always faster, often cheaper” mantra follows similar trends in the PC industry, and is expected to continue as technologies evolve.

¹³ Based on reports and testing detailed later in this document

¹⁴ Powell River Peak article, October 28 2009 • www.tinyurl.com/Rural-areas-lack-speed

¹⁵ “PRRD wants High Speed Internet” • www.groups.google.ca/group/hsi-for-prrd

¹⁶ Speed claim based on 1.2 Mbps home service available today, vs. 10 Mbps service forecast. Barrett Xplore Press Release • www.xplornet.com/media/59053/barrett%20xplore%20jupiter_oct%202009.pdf

¹⁷ A type of advanced cellular technology known as “Evolved High-Speed Packet Access”

¹⁸ Claims from *Bell Canada*, www.bell.ca - not all coverage is created equal, however!

¹⁹ Bell/Telus cellular is 84% as fast as Shaw *High-Speed Warp*, and much faster than any other service.

Identifying Coverage in the Regional District

Now we must examine the story of Internet connectivity across the region. It's a complicated tale, as varied as the district itself. Who has access and who does not? Have new technologies changed the balance? What challenges and opportunities exist in 2009, and what does the picture really look like out there? To answer these questions in the limited time available, we gathered data in a number of ways:

1. Resident feedback was invited through various media (Newspaper²⁰, Internet mailing lists, PRRD website posting),
 2. Internet service providers and area stakeholders were interviewed directly,
 3. Service provider websites were examined in detail²¹,
- and,
4. Cellular Internet was live-tested through much of the regional district, by Second Flux technicians²².

All information was acquired in November 2009, for a uniquely contemporary view of the area. Colour maps of the findings can be found in Appendix C.

City of Powell River

Mentioned here only briefly, Powell River can be regarded as the gold standard for access in the regional district. **Shaw**, **Telus** and **Uniserve** offer multiple connectivity packages. Shaw and Telus sell medium-speed packages for less than the cost of dial-up, an irony that is not lost on envious rural residents. Still, the average Powell River Resident spends more than this, so that the average yearly cost of Internet is quite similar²³. Even in the city, coverage is not 100%; Telus does not reach some areas in

²⁰ The author wishes to thank editor Laura Walz and the Powell River Peak for publishing an article on very short notice, without which community outreach would have been reduced.

²¹ A full listing of Internet Service Providers (with typical subscription costs) appears in Appendix A.

²² Testing methodology is described in Appendix B.

²³ Based on noted subscription choices and resident reports. It is important to note that while on average Powell River residents do not pay less for access, their access is generally faster and/or more reliable.

Cranberry, although Shaw does²⁴. The reliability of these wired networks²⁵ are very good, although not perfect. A Shaw customer may experience an hour of outage every few weeks, or more frequently depending on neighbourhood²⁶. Businesses that rely on Internet connectivity sometimes pay for two networks (e.g. Shaw + Telus) as a best practice²⁷. Uniserve resells Shaw & Telus lines with its own accounts & pricing; it has coverage identical to these companies and need not be mentioned separately.

Cellular connectivity through **Bell**, **Rogers** and **Telus** is widely available in the city, but there has been little reason for subscribers to leave their normal, wired service. The recent launch of the new Bell/Telus²⁸ network may generate more interest in cellular, especially to residents who need broadband access on the go (Real Estate agents, etc).

Verdict: As one expects with economies of scale and urban densities, Powell River city Internet access is comparatively fast, reliable and inexpensive. Service providers are all out-of-town companies, so there is no real sense of community involvement. Internet is treated like a utility that just works – and for the most part it does exactly that.

Area A

Beginning north of the city limits and including Sliammon First Nation, Lund, Savary, and Hernando, Area A is truly a mixed bag of access. Generally superior Internet service provided by **Shaw** spreads north from the city until it terminates on Sturt Road, having covered Sliammon through Klahanie as well as Wilde and Southview roads²⁹. Beyond the Sturt Road termination, access by **Xplornet** and the three **Cellular** providers are the only choice. Cellular coverage is good near the coast (covering such areas as Atrevida Road very well, especially on the **Rogers** network), but inland communities like the Craig Road and “Dogpatch” must struggle for this signal. For some homes in this region, Xplornet, with its relatively high cost, becomes the only

²⁴ Based on resident reports.

²⁵ Many customers use personal wireless systems attached to these networks, however the method of delivery to the building is still wired.

²⁶ Based on our own experience and customer reports.

²⁷ Second Flux customer data and network research.

²⁸ Bell and Telus partnered to launch the network, each company sells distinct access accounts.

²⁹ Access is not 100% complete on these rural roads; we have reports of Southview residents who live too far up to have service.

option. Continuing north, cellular coverage remains tenable on both sides of the Malaspina Peninsula near the sea. The east side (lower Malaspina Road and surrounding area) generally works best with **Bell/Telus**, while the west side (Old Mine Road, Krompocker Road) works best with **Rogers**. Some portions of Malaspina Road near the highway are without signal, as is the descent toward Lund including Prior Road. Reliable cellular service does not exist here, except to those with ocean views.

Entering Lund itself, we find wireless radio service provided by **Twincomm**, which has received high marks from customers. Speeds and prices are reasonable, and while reliability is not perfect, users firmly believe it to be the best thing going. We received reports that without the access provided by Twincomm, some residents would simply move away. Twincomm's range is relatively limited in Area A, serving Lund and most of Savary Island, as well as more remote properties on Hernando Island, Bliss Landing, Mink Island and Galley Bay. In another example of irony, broadband access in Desolation Sound is superior to portions of Highway 101. A few residents outside the core areas can also reach Twincomm's service, but coverage is generally quite specific.

Perhaps the most exclusive Internet service provider in the region, **MasterOne** offers wireless connectivity to a handful of residents on south Savary, who remain out of range of Twincomm's signal. The exclusivity stems from the fact that MasterOne is not currently accepting new customers. In addition to Savary, the service reaches a few homes on the mainland – primarily those that face toward Westview.

Cellular access was not tested from the Area A islands due to time constraints; we expect based on marine tests and reports from residents that coverage will be nearly universal on any property in view of the sea.

Moving north from Lund, coverage declines sharply. Here cellular service is sparse, with connectivity losses noted even on nearby Finn Bay Road. Satellite seems like the only reliable broadband option. The first few kilometres of Sarah Point Road saw negligible coverage. The story is familiar: the further you get from an ocean view, the weaker this type of service becomes.

Verdict: Area A wants in! Some areas are badly underserved, while major communities like Sliammon and Lund are doing quite well. This area has the wide variety of access levels in the district, and faces challenges due to a widely dispersed population in varying terrain.

Area B

Beginning south of the city border and extending to Whalen Road, Area B includes Paradise Valley as well as Nootka, Covey and Tanner streets beyond city limits. The area is reasonably well served by the same Powell River providers **Shaw, Telus** and **Uniserve**; coverage is not universal and Telus in particular does not serve all residences. The area has fairly reliable cellular coverage as well, with the **Bell/Telus** network showing particularly good levels of service on all properties we checked.

Verdict: Area B seems to enjoy the best Internet coverage of the electoral areas, benefiting as it does from proximity to the city and a topography that favours cellular transmission.

Area C

From Whalen Road south to Saltery Bay, including Black Point, Kelly Creek, Lang Bay and Stillwater, Area C coverage runs the gamut from excellent to nil. Similar to Area A, service begins strongly with **Shaw, Telus** and **Uniserve** coverage south of the city. Telus connectivity ends around Black Point, while Shaw terminates after Lang Bay & Palm Beach roads. Now cellular coverage must pick up the slack. **Bell/Telus** service is generally superior to **Rogers** in this area. Loubert Road is almost out of cellular range, but the Bell/Telus signal remained usable through that community (Leaside Road, Roberts Road, etc). Coverage is reduced but generally usable through to Saltery Bay, with improvements noted at higher points along the road. Saltery Bay itself is poorly covered by cellular, with Bell/Telus coverage reduced but still functional.

Despite coverage similarities to Area A, Area C does not have a dedicated service provider such as Lund finds in **Twincomm** and **MasterOne**. Saltery Bay and East Stillwater/Scotch Fir are on the very edge of cellular coverage, and the area was recently identified by Industry Canada as unserved by broadband³⁰. When cellular modems can't work, an **Xplornet** satellite dish is the usual conclusion.

Verdict: Area C mirrors the access story of Area A in gradually decreasing service the farther you travel. Unlike Area A, there is no good news of a specialty access provider at the end. The final southern communities of Area C exemplify what a connectivity gap looks like today.

³⁰ *Industry Canada*, National Broadband Maps: Canada's Unserved Area (click on BC South Coast), www.ic.gc.ca/eic/site/720.nsf/eng/h_50010.html

Area D

Texada Island benefits from good coverage in Van Anda and Gillies Bay, provided by **Twincomm** and **GBIS/LIAS**³¹ respectively. Both services are regarded as superior to satellite and cellular by local residents; coverage can be quite specific with some homes “just up the hill” missing out. Reliability is not yet 100%, but users are generally quite satisfied with both services. Speed is good, and cost is reasonable. The GBIS service inherits an unusually flexible rate structure from its upstream partner LIAS, as described in the Area E section. About 50 households are currently served by GBIS.

The Van Anda and Gillies Bay systems were funded by separate grants, so the two services are actually not permitted to overlap. There is still much expansion that either could pursue, into the rest of the island and perhaps beyond. As noted on page 7 of this report, the Gillies Bay Internet Society is building a new transmitter on Mt. Pocahontas, its third on the island.

For residents living somewhere between the built-up areas of Van Anda and Gillies Bay, cellular Internet is often a viable choice. Cell coverage was reliable in most areas between the two communities, with **Bell/Telus** the overall winner. Shelter Road also fared well, and even the length of Central Road maintained reliable coverage with Bell/Telus, although **Rogers** was inconsistent. The east end of Texada Island is also well served; Crescent Bay Road only lost out at the very end (unusual, as coverage tends to improve near the sea). The roads around Blubber Bay have great coverage, and here the tables are turned, with Rogers superior to Bell/Telus. **MasterOne** provides a limited service to Blubber Bay; as mentioned earlier the company is not currently accepting new customers.

Verdict: Van Anda and Gillies Bay are well served by specialty providers, and service expansion continues. More remote residents must try their luck with cellular or satellite for now; cellular coverage is reasonable in most areas. Mixed topography and a widely distributed population present some challenges, but enthusiasm from the local specialty providers bodes well for the region.

³¹ Gillies Bay Internet Society and Lasqueti Internet Access Society, in partnership.

Area E

Comprising Lasqueti and surrounding islands, Area E receives substantial wireless coverage from the **Lasqueti Internet Access Society** (LIAS). A transmitter on Vancouver Island provides the broadband service, which began in 2007³². Grants played a vital role here, and include assistance from the BC Ministry of Labour and Citizens' Services. About 80% of the island is within range of this signal today³³, and service expansion is continuing. Approximately 100 households currently subscribe, with several of the islands around Lasqueti also using the service. Coverage gaps exist to the south near Squitty Bay, and well as the mid-island interior; expansion into these areas continues. The system is quite flexible, providing easy access to residents and visitors alike. Pricing is very competitive. Besides providing coverage locally, this signal is retransmitted on to Area D, where it enables the Gillies Bay Internet Society.

Cellular testing was not performed on Lasqueti as part of this study; coverage is expected to follow the usual rule of good access near the sea. The importance of cellular is diminished here by generally excellent (and still expanding) LIAS coverage.

Verdict: Thanks to the hard work of LIAS, broadband coverage is very good in this area. Some gaps remain as the society works to improve service. Like other local access providers in this report, LIAS demonstrates a high level of care for small population groups. Grants played an important role in this success story, and user revenue will help sustain the network going forward.

³² *Lasqueti Island Website - About Lasqueti Wireless* • www.lasqueti.ca/services/broadband

³³ Discussions with James Booker, Lasqueti Internet Access Society Manager

Finding the Gaps

No one Internet service reaches every PRRD resident. Of course, few services in this large and varied region are truly universal — as stated in the introduction, some households do not receive normal phone or even electrical service. Still, many residents who live in built-up areas have a reasonable expectation of broadband access. These homes tend to be situated on or near a major road (most often Highway 101, although other areas including rural Texada are indicated). Residents are not wilderness pioneers, they generally have normal electrical service, lot sizes, reasonable water systems, etc. Most of the people who agitate strongly for broadband Internet service do not consider themselves remote. The lack of Internet service may be the most significant barrier these residents face at their location.

Most gap areas do have access to **Xplornet Satellite** and **Telus Dial-Up**, but both of these technologies are regarded as imperfect by local residents. The poor performance of dial-up has already been proven, and Xplornet faces challenges with a necessarily high cost (\$1600 per year for broadband speeds, 2-3 times higher than competitors³⁴) as well as somewhat diminished reliability. If these issues are resolved, coverage gaps in the PRRD would close overnight: Xplornet service can be installed almost anywhere. For now, however, the majority of residents do not consider it to be equitable broadband Internet access.

In performing the study, two areas stand out as proportionally underserved. These areas have a relatively high population combined with limited coverage options, although they are not the only communities so affected.

Craig Road Neighbourhood (Area A)

Ten kilometres from the city limits on Highway 101, this area boasts a high household count (124 homes within a 3 km radius³⁵, including 50 in the immediate vicinity³⁶). The closest residents are 2 km from the last wired high-speed access, and wireless access

³⁴ Normalized annual pricing for a three-year term at broadband speed, including initial costs. Cheaper options exist but do not qualify as broadband. For more pricing details, see Appendix A.

³⁵ Based on door-to-door canvassing by Peter Tebbutt, spring 2009; this includes Atrevida Road, which has better coverage options. Emmonds Road was not included and would increase the household count.

³⁶ Known houses listed with the Powell River Regional District, Craig and Plummer Creek roads plus “Dogpatch” and immediate highway.

is blocked by a cellular shadow across much of the area³⁷. Phone line quality degrades dial-up access³⁸, slowing down this already slow connection and causing disconnects.

Residents have a high interest in seeing something better. In the spring of 2009, area resident Peter Tebbutt organized a petition for faster Internet access, collecting 96 signatures representing 74 neighbourhood homes³⁹. Participation was without exception enthusiastic⁴⁰. The petition was delivered to Telus, but failed to have an appreciable impact. Residents have lobbied **Telus**, **Shaw** and various levels of government with little to no results, so that broadband access has become something of a long-term grievance. At the same time there is a strong feeling from this community to keep working hard for this access. As Mr. Tebbutt demonstrates, residents are motivated and ready to help secure the access they have waited so long for.

Stillwater & Sallery Bay Neighbourhoods (Area C)

The communities south of Lang Bay face diminishing coverage. Extensive properties have been developed in the area, and development of surrounding lands continues with substantial real estate projects. The lack of broadband access is a continuing source of frustration and disappointment; the area has actually lost residents because of this issue. Ex-resident Sharon Thomas provides a typical example: her job requires telecommuting, which Ms. Thomas could not fulfill due to lack of broadband. Unable to work from her residence on Leaside Road, she put her home up for rent and moved back to Calgary⁴¹. Ms. Thomas's case is not unique⁴², and can only have a chilling effect on the local economy.

³⁷ Cited by residents and confirmed during live testing for this report, cellular coverage in many areas is poor on all three carriers (Bell, Rogers, and Telus).

³⁸ Findings here are based on resident reports.

³⁹ Petition on file.

⁴⁰ Noted by Peter Tebbutt and confirmed by resident reports.

⁴¹ Based on resident reports.

⁴² It is difficult to reach individuals who have left the PRRD. However, we have reports from retired residents indicating that they would move away if they were still active in the workforce; other residents who do have broadband cite the use as mandatory to their ability to work in the community. Still others must drive to Powell River each day because they cannot telecommute from their rural home.

Other Important Mentions (Area A)

A patchwork of gaps remain throughout the regional district, some for only a few hundred metres or less. Without diminishing these remaining areas, it is important to highlight the Malaspina Road / Prior Road neighbourhood south of Lund, as well as the Baggi Road / Sarah Point Road neighbourhood to the north. These near-Lund areas are not in range of **Twincomm** as they do not border the sea; cellular coverage is likewise very poor. Residents cite access to business and educational opportunities as leading concerns. Generally speaking, they do not seem to share the same level of frustration as the Craig and Stillwater areas mentioned above, possibly due to different expectations. Nevertheless, residents are keenly aware of what they're missing, and have a right to request a fair share. Exact household numbers were not immediately available, but could easily exceed 40 in each of these near-Lund neighbourhoods.

Findings & Insight

Although many coverage gaps still exist, there is significant reason for optimism in the region. Key factors include:

1. **Technologies are evolving rapidly**, increasing speed and coverage while driving costs down. Gains are especially impressive in wireless technologies.
2. **A healthy competitive environment exists** in the region, with nine organizations providing service. Gaps still exist where choices are few and expensive, but these gaps are shrinking.
3. Despite operating in a recession, **service providers are tending to grow** their user base⁴³. This fact speaks to the importance of broadband and the long-term sustainability of these organizations. Service providers remember the losses of the dot-com bubble⁴⁴, and tend to manage budgets carefully.
4. **Residents are increasingly willing to organize** and get involved in their efforts to secure access, helping measure exactly what is needed. They do not want something for free; residents are willing to pay a reasonable price.
5. **All levels of government are recognizing the importance of broadband**, and the need to address remaining access gaps. Recent examples include strong federal and provincial initiatives, as well as the PRRD decision to commission this report.

In short, technologies are ramping up, the providers are willing to grow, the people know what they want, and the government is listening.

This is a powerful formula, and an exciting time for Internet access in the Powell River Regional District. Significant progress is possible. The most important challenges are to build on this momentum, and keep it focused on attainable goals.

⁴³ While access societies are generally eager to share user counts, commercial organizations are generally protective of these figures. Beyond the numbers available, growth claims are based on resident and customer reports, as well as our own experience in the community. A few services are shrinking, a few are static, but the majority is in growth, and the net overall user count must also be growing.

⁴⁴ A huge boom-and-bust cycle occurring in 1999-2001, the dot-com bubble eliminated hundreds of Internet service providers that had grown too fast. The ISPs that followed tended toward smaller, more pragmatic budgets, less competitive brinkmanship, and readiness for varied economic climates.

Executive Insight

◆ Specialty service providers have the most interest in reaching into the small gaps. Services like Twincomm and GBIS are committed to serving the needs of local residents on a personal scale, where even a dozen homes is an important user base.

Two important areas of consideration include:

◇ Twincomm has expressed real interest in serving mainland Area A residents via an inland wireless transmission system.

◇ Although intended for Texada, a new transmission tower in progress on Mt. Pocahontas is well within broadcast range of residents in and around Stillwater. The majority of Area C's coverage gaps may be resolved by an expansion of service from this tower.

◆ Cellular Internet speed increased dramatically this month (November 2009), while coverage also expanded. Although the service is not appropriate for significantly heavy data transfer, light-to-average users would be well served at truly incredible speeds⁴⁵. A hardware device called a signal booster or cellular amplifier can improve performance for customers on the edge of a network⁴⁶. Competition is fierce in this area and the story is expected to get better. A related technology to watch is *cellular tethering*, which allows popular cellphones to work as USB modems when connected to a laptop. Using a cellphone as a modem reduces costs (often dramatically), and allows users to try out wireless access on a whim.

◆ Specialty ISP MasterOne is looking to sell its wireless access point to another provider. Transmission is based in Westview and reaches Savary and Texada islands in places not generally covered by other providers. A new owner for the system could bring immediate expansion and network improvements.

⁴⁵ Heavy usage is defined here as constant file sharing or multimedia use; see description in Appendix A.

⁴⁶ Area residents have used cellular amplifiers by Wilson Electronics, for around \$300. A good use for these devices are homes where cellular coverage barely exists, e.g. coverage is present from the driveway or the roof of the dwelling. We have not tested this technology; this month an Area A resident reported an incredible gain from "barely any service" to 4 out of 5 bars. Wilson amplifiers are available from North Island Communications in Campbell River BC • 1 877 977 9207 • www.nicomm.com

Novel Technologies

As is so often the case, several new technologies are waiting in the wings. Highlighted here are three of the most promising future technologies, backed as they are with widespread industry support, and with launch dates on the near horizon (1-2 years). While none of these exist in the Powell River market today, all have the potential to dramatically change the access landscape if and when they arrive.

◆ Broadband over power lines (**BPL**) was suggested by the Powell River Regional Economic Development Society (PRREDS) in a 2008 briefing paper⁴⁷. This technology can move broadband over conventional power lines directly to the home power outlet, dramatically simplifying distribution. Speeds of up to 1 Gbps (1000 Mbps) are theoretically possible — an incredible 40 times faster than the fastest available access today⁴⁸. BPL faced initial compatibility issues with North American power lines as well as radio interference; these have generally been resolved⁴⁹. Progress continues, with the International Telecommunication Union (ITU) standards body ratifying the first official BPL standard just last month, October 2009. Although we believe wireless technologies hold the most promise for the PRRD at the moment, in a shifting marketplace these things can change overnight. BPL remains a dark horse technology that may play a key role in future regional access; participation from BC Hydro and the BC Transmission Corporation would be essential.

◆ The IEEE 802.22 Wireless Regional Area Network Standard (**WRAN**)⁵⁰ is a future technology that has special potential for the area. Industry Canada's Communication Research Centre identifies WRAN as the most promising choice for rural and remote broadband access⁵¹. Based on unused TV channel spectrum, these wireless signals can reach an impressive 40 km range, and are expected to handle difficult terrain extremely well. Prices are expected to drop into good affordability following the launch. This standard is under development, and expected to complete in 2010. The 802.22 standard is from the same group that brought us 802.11 (popularly known as Wi-Fi), used in most personal computers today as the world's most popular wireless protocol.

⁴⁷ Prepared for the Powell River Regional District. PRREDS website: www.prreds.com

⁴⁸ As part of the G.hn standard. ITU Press Release: www.itu.int/newsroom/press_releases/2009/46.html

⁴⁹ Canada's National Amateur Radio Society: Power Line Communications
www.rac.ca/en/amateur-radio/regulatory/threats/power-line-communications.php

⁵⁰ IEEE Press Release • www.standards.ieee.org/announcements/pr_80222.html

⁵¹ Industry Canada CRC, Rural and Remote Broadband Access
www.crc.gc.ca/en/html/crc/home/research/rrba/rrba

◆ With cellular data technology well into its third generation, all eyes are on the next generation of cellular services — 4G. With speeds up to 15 times faster than currently available⁵², 4G technologies leave the new Bell/Telus network in the dust. Not that the companies are worried; both Bell and Telus have already announced plans to offer 4G service⁵³, and Rogers is expected to follow suit. Cellular companies seem to be settling in for one continuous series of network upgrades, with even the current network (3G) eligible for more increases before retirement. Any further upgrades have the potential of surpassing wired access for speed. Importantly for this region, 4G allows reasonable data speeds up to 100 km from the tower. Almost all residents of the PRRD are within 100 km of a cellular tower⁵⁴; only time will tell how this powerful new standard can handle the area's mixed terrain.

⁵² Based on current download speeds of 21.1 Mbps vs best-of-class LTE 4G speed of 326.4 Mbps. Plenty of technical information is available on the 3GPP website • www.3gpp.org

⁵³ Bell Press Release, for example • www.bce.ca/en/news/releases/bm/2008/10/10/74991.html

⁵⁴ *Canadian Cellular Towers Map* by Steven Nikkel (PRRD Area Shown) • www.tinyurl.com/prrd-cell-map

Key Recommendations

◆ Interested parties should **work with all local stakeholders**, reducing wasted effort and streamlining communication. Groups should take a unified approach to working with various levels of government. There is great strength in numbers; let us speak for our region with a single voice. The PRRD can assist in this area by facilitating connections and bringing groups together. The recently formed Internet access committee should be a key partner in discussions involving Areas A & C.

◆ **Local residents should be informed & empowered.** Informed: provided with useful information on what Internet services exist today. Empowered: brought into relationships where they can work proactively to secure better access. The frustration of these residents is a powerful force, and should be channelled toward achievement of these goals.

◆ The PRRD should **appoint an access consultant** to regularly advise regional directors to the ongoing state of Internet access projects, technologies, opportunities, and challenges. This individual should also liaise with interest groups, stakeholders, and concerned residents in all areas of the PRRD. Progress reports could be provided from this position, and area residents would have a single, knowledgeable point of contact. This person should bring a good technical understanding of the industry, as well as excellent communication skills.

◆ PRRD should **make up-to-date information available to residents** concerning Internet options today. A public handout and/or web page could be prepared. This information would be especially useful for new or potential residents. If another community organization would be more appropriate home for this document (such as the Powell River Chamber of Commerce, or area websites), PRRD should help ensure that this information is comprehensive and accurate. Although the regional district has no specific obligation to provide this, being able to direct frustrated residents to useable information demonstrates good faith. As discussed above, this can help bring such individuals into larger action and support groups. Together we can reduce wasted effort and get on with the business of connecting our community.

Appendixes

Appendix A: Internet Service Providers

Service providers currently active in the PRRD are listed here in alphabetical order. Telus appears more than once due to a wide variety of connectivity options. Bottom-line pricing has been collected, combining all normal costs a user is expected to pay to begin a service, and the monthly costs thereafter. Tax is not included, but every other fee is. Prices are residential; some ISPs charge more to business customers.

A summary and general comparison of ISPs can be found on page 6 of this report.

When considering access providers, we must consider **speed** and **usage**. Speed is the amount of time the service takes to deliver content; faster speed means less waiting. Some kinds of content are not possible at all without high speed. This report considers three speeds and three different usage levels.

Low Speed - Only one technology is truly low speed, and that is dial-up.

Medium Speed - Faster than dial-up, but not as fast enough as broadband⁵⁵, these are often sold as “lite” or “basic” accounts. Be aware that medium speed connections are sometimes marketed as broadband, since the term is not legally binding.

High Speed - Any service that qualifies as broadband in this report. Considered ideal for today’s Internet. The widest variety of accounts exist in the high speed segment, with some close to the minimum required speed and others far higher.

Usage does not describe the hours and minutes that you spend on a service, but how much data you use in a month; how much content has been transferred to or from your computer. These examples show usage over a typical high speed connection.

Light Usage - Email, basic web surfing (banking, shopping, light browsing). An hour of use a day.

Medium Usage - Using all normal features of the Internet in a moderate way. Email, average web surfing, some videos, a few big downloads, listening to online radio. Five hours of use a day. Today’s average Internet user.

Heavy Usage - The key factor here is frequency; heavy usage involves most of the same features, only much more aggressively, for example is all-day video streaming.

⁵⁵ A discussion of what constitutes broadband can be found on page 4.

Bell Canada

www.bell.ca • 800-773-2121

Although Bell offers a wide selection of Internet access products, only its mobile Internet package is currently offered in the PRRD. Speed is extremely fast due to next-generation HSPA+ network, and coverage is good with a few noted exceptions. Customers with laptops can bring this access with them across most of Canada. Fastest wireless option in PRRD (tied with Telus⁵⁶). At the moment, Bell offers a wider selection of cellular modems than Telus; brands used are different as well. Cellular modems purchased from Bell before November 2009 are likely CDMA, now essentially an obsolete technology. These should be replaced.

Speed of service

21.1 Mbps Mobile Wireless. Very high speed; fastest wireless available.

Startup costs

\$110 (with 2 year contract) or \$210 (off contract) for typical hardware ⁵⁷

Monthly costs

Light usage: \$37 per month (500 MB Traffic)

Medium usage: \$92 per month (5 GB Traffic)

(many levels exist between these two options)

Usage is on a flexible plan, you pay only for the data used each month⁵⁸. The flexibility is a welcome addition, especially for customers who may have varied usage habits. Heavy usage is not advisable on this plan; far too expensive. 25 GB of data transfer would cost \$692⁵⁹.

⁵⁶ Testing for this report was performed with Telus hardware; since Bell shares the same network and technologies we can assume that results will be similar.

⁵⁷ The Novatel Wireless U998 USB Modem
www.bell.ca/shopping/PrsShplnt_MobileInternet_TurboStickU998.page

⁵⁸ Bell Mobile Internet Flex plan • www.bell.ca/shopping/Mobile-Internet-Flex-plan/TSFLXC.details

⁵⁹ \$85 for 5 GB account, plus 20 GB extra at \$30/GB, plus \$7 system access fee.

Lasqueti Internet Access Society (and Gillies Bay Internet Society)

www.lasqueti.ca/services/broadband • 877 838 5778, or 604 486 7100 in Gillies Bay

As discussed in Areas D and E, the LIAS (represented on Texada by GBIS) provides equitable wireless access to Lasqueti and Texada Island residents. See pages 11-12 for more details about this well-received service.

Speed of service

1-2 Mbps *measured* speed. Access societies have little need to overstate speeds; a commercial organization may market such service as 11 Mbps. In any case, certainly enough for a high speed designation.

Startup costs

Long-term users usually purchase a dedicated radio, prices can vary from \$50 to \$200 depending on site and technology used.

Monthly costs

\$40 per month⁶⁰.

(special prices also exist for hourly, daily, weekly, and yearly access)

MasterOne Security & Technologies

604 483 3533

Broadcasting on wireless radio from downtown Westview (Powell River), MasterOne serves a handful of customers on Savary, Texada, and a bit of the mainland shore. The company is not focused on wireless networking at the moment, and does not wish to grow that side of the business. In fact, current operator Kevin Unger is willing to sell this wireless access point off, ceding control to an appropriate service provider or access society. With new ownership, the network could easily be expanded. No other group is using wireless radios from this area, and the possibilities are intriguing.

Speed of service

11 Mbps Wireless Radio, high speed, measured speeds similar to LIAS above

Startup costs

Not applicable – not accepting new customers on system

Monthly costs

Not accepting new customers, existing customers pay less than \$50.

⁶⁰ Lasqueti Wireless Rates • www.lasqueti.ca/services/broadband#rates

Rogers Communications Inc

www.rogers.com • 888-ROGERS1

Long an innovator in cellular Internet, Rogers finds itself playing catch-up to rivals Bell and Telus. Previously the company led the entire North American market with an aggressively modern cellular network. The Bell/Telus launch should lead to heightened competition as Rogers fights to regain its crown. The company already offers HSPA+ service in major Canadian cities (same speed as Bell/Telus); only basic HSPA is offered in the PRRD – that's 3 times slower. Rogers has a long history of bringing new technologies to this area. Their service footprint is slightly different from Bell/Telus, neither better or worse, but covering some different places on the edge of the network.

Speed of service

7.2 Mbps Mobile Wireless – high speed.

Startup costs

\$35 (with 2- or 3-year contract), \$50 (with 1-year contract), \$235 (off contract)⁶¹

Monthly costs⁶²

Light usage: \$32 (500 MB traffic)

Medium usage: \$83 (5 GB traffic)

(many levels exist between these two options)

The prices above are for fixed usage plans. Rogers may also offer a flexible rate plan similar to Bell⁶³. Heavy usage is not advisable on any cellular plan; far too expensive. 25 GB of data transfer would cost \$687⁶⁴.

Rogers hardware is less expensive, but the speed difference weighs heavily on them. Until Rogers upgrades service in this area, Bell/Telus have a significant advantage.

⁶¹ Rocket™ Stick ZTE MF636 USB Modem. More expensive modems are available from Rogers, but not relevant to this area (no speed advantage yet). www.tinyurl.com/ztemf636

⁶² Rogers Data Plans • www.rogers.com/web/content/wireless-plans/iphone_card_plans

⁶³ For a description of flexible rate plans, see the entry for Bell Canada on the previous page.

⁶⁴ \$85 for 5 GB account, plus 20 GB extra at \$30/GB, plus \$2 regulatory recovery fee.

Shaw Communications Inc

www.shaw.ca • 604-485-7756

Arriving in the PRRD back in June 1998, Shaw quickly introduced the region to broadband access. With a largely unbroken record in providing the fastest Internet available, Shaw has generally managed to stay ahead of rival Telus ADSL, often adding capacity just in time. Recent network upgrades maintain the winning streak⁶⁵, but Shaw faces new competition from cellular access.

Despite many network improvements in the past ten years, the Shaw coverage area does not tend to show growth. This is frustrating to rural residents who continue to wait a few kilometres (or in some cases, just 100 meters) from the termination point. Nor are Shaw's higher speed packages available on all points of the their existing network.

Shaw data usage is extremely generous, with the most basic account exceeding medium usage needs. The rest of the accounts are suitable for heavy use, and Shaw doesn't seem to charge surprise fees when customers stray over the line. The company is widely lauded for superior customer service.

Speed of service

1 Mbps, 7.5 Mbps, 15 Mbps, or 25 Mbps. 1 Mbps is medium speed, while the rest qualify as high speed. The 25 Mbps service is the fastest in the PRRD.

Startup costs

\$0 - no charge for installation or hardware rental.

Monthly costs

1 Mbps Lite (medium speed): \$31

7.5 Mbps High Speed: \$44

15 Mbps High Speed Extreme: \$54

25 Mbps High Speed Warp (fastest in the area): \$105

Shaw offers bundle savings to customers who order TV service, a common occurrence. This reduces monthly costs by around \$9.

⁶⁵ We were unable to find any residents using this new *High-Speed Warp* service, but customer service representatives and the Shaw website confirm availability.

Telus High Speed Internet (ADSL)

www.telus.com • 888-811-2323

A standard in the city of Powell River for many years, continuing upgrades keep the Telus ADSL⁶⁶ network flexible and fast. Three plans offer user choice, from a minimal but inexpensive 256 Kbps, all the way up to 15 Mbps. The two high speed plans include a neat modem/wireless router, allowing multiple computers to use this service right out of the box. Some coverage expansion seems to have occurred in Area C, but Telus ADSL is largely confined to the city of Powell River and Area B.

Usage limits are similar to Shaw, very generous. The most basic account exceeds medium usage needs, and the rest are suitable for heavy use. Telus doesn't seem to charge surprise fees when customers stray over the line.

Speed of service

256 Kbps, 6 Mbps, or 15 Mbps. The first package is fairly slow (second slowest after dial-up), while the rest are quite fast.

Startup costs

\$0 - no charge for hardware rental; user installs service themselves.

Monthly costs

256 Kbps High Speed Lite (a misnomer, as this is medium speed): \$25

6 Mbps High Speed: \$35

15 Mbps High Speed Turbo: \$48

Telus offers bundle savings to customers who order telephone or digital TV services⁶⁷, a very common occurrence. This reduces monthly costs by \$5.

⁶⁶ A technical term relating to high speed over digital phone lines. Telus avoids the term in modern marketing; we use it here to differentiate from the company's two other offerings.

⁶⁷ Telus High Speed Internet: Plans & Prices • www.tinyurl.com/telus-hs-plans

Telus Mobile Internet

www.telusmobility.com • 866-552-2273

Similar to Bell, Telus Mobility offers best-of-breed cellular service in the area. Speed is extremely fast due to next-generation HSPA+ network, and coverage is good with a few noted exceptions. Customers with laptops can bring this access with them across most of Canada. Fastest wireless option in PRRD (tied with Bell). Cellular modems purchased from Telus before November 2009 are likely CDMA, now essentially an obsolete technology. These should be replaced.

Speed of service

21.1 Mbps Mobile Wireless. Very high speed; fastest wireless available.

Startup costs

\$35 (with 2- or 3-year contract), \$165 (with 1-year contract), \$285 (off contract)⁶⁸

Monthly costs⁶⁹

Light usage: \$30 (500 MB traffic)

Medium usage: \$85 (5 GB traffic)

(many levels exist between these two options)

Heavy usage is not advisable on any cellular plan; far too expensive. 25 GB of data transfer would cost \$1085⁷⁰, excessive even by cellular standards.

⁶⁸ Sierra Wireless 306 Mobile Internet Key • www.telusmobility.com/en/BC/sierra_usb_306_modem/

⁶⁹ Telus Mobile High Speed Plans • www.telusmobility.com/en/BC/connectplans/

⁷⁰ \$85 for 5 GB account, plus 20 GB extra at \$50/GB.

Telus Dial-up Internet

www.telus.com • 888-811-2323

Telus offers two dial-up plans anywhere its phone service is available⁷¹. The shortcomings of dial-up are well known, but at least the service is relatively affordable.

Speed of service

56 Kbps, “low speed” no matter how you cut it.

Startup costs

\$0, but hardware is not included. If customer does not already have a dial up modem, these cost \$35-\$80 from third parties.

Monthly costs

\$14 for up to 12 hours per month

\$27 for unlimited use

Twincomm

www.twincomm.ca • 866-446-6004

Service areas in the PRRD include Lund, Van Anda, and Galley Bay, as well as Savary, Hernando, and Mink Islands. Installation consists of mounting a wireless radio system which receives a signal from a Twincomm’s repeater stations. Usage limits are reasonable, easily accommodating medium usage habits.

Speed of service

512 Kbps, 1 Mbps, or 1.5 Mbps; medium-speed to high.

Startup costs⁷²

\$300 (additional equipment may be required)

Monthly costs

512 Kbps Light (Medium Speed): \$39

1 Mbps Standard (Medium Speed): \$59

1.5 Mbps Office (High Speed): \$89

Discounts are available for educational uses, a rare and welcome option.

⁷¹ Telus Dial-up Plans • www.tinyurl.com/telus-dial-plans

⁷² Twincomm Services • www.twincomm.ca/services.html

Uniserve

www.uniserve.com • 877-864-7378

Uniserve is a service reseller; they resell access lines from both Telus (ADSL) and Shaw. Because of this relationship, coverage areas are essentially identical to the two companies. Good middle-of-the-road broadband accounts, although missing the high- and low-end options offered by larger companies. Usage limits are generous, accommodating heavy Internet use; the company does charge a moderate amount for overage that exceeds these high limits⁷³. Despite charging slightly higher prices than Shaw or Telus for the service provided, the company commands a loyal following among customers who prefer to support this almost-local business. Founded in Aldergrove and now headquartered in New Westminister, BC, Uniserve is the closest thing Powell River city residents have to a local service provider. The company remains focused on excellent customer service.

Speed of service

3 Mbps or 6 Mbps; high speed.

Startup costs⁷⁴

\$13 (if renting modem), \$113 (if purchasing modem)

Monthly costs

3.0 Mbps (high speed): \$41

6.0 Mbps (high speed): \$45

Purchasing the modem reduces monthly costs by \$5. Other promotions often reduce first-year charges.

⁷³ 70 GB and 100 GB limits respectively, with reasonable over-limits charges of \$2 per GB.

⁷⁴ Uniserve DSL Plans (other options may exist for cable Internet, not listed)
www.uniserve.com/?page=products/highspeed/west/compare

Xplornet (Barrett Xplore)

www.xplornet.com • 866-841-6001

Satellite goes *everywhere*. That's the message local installer Glen Roscovich tells his clients, and he's right. No other technology comes close to this level of coverage, although it also means relatively high prices. Hardware costs start at \$199, but installation and activation can set customers back hundreds of dollars more. Customers may find their speeds throttled back if usage exceeds the network's design⁷⁵; this happens more often with the less expensive accounts. The service is designed for light and medium usage, not heavy; the decision to "slow down" users is unpopular but generally preferable to large fines.

Speed of service

Eleven plans offer widest variety on market. 5 accounts aimed at home users range from 512 Kbps to 1.2 Mbps, all are medium-speed. Six business-class accounts offer best performance from 1.5 Mbps to 5 Mbps, all high-speed.

Startup costs

\$500 (with 3 year contract) to \$800 (off contract). An installation sale is currently available to local residents, and could lower these rates by \$150.

Monthly costs

512 Mbps KaZam (medium speed): \$50 on contract, or \$60 off contract⁷⁶.

1.5 Mbps KaBang (high speed): \$120⁷⁷

(Nine other accounts are available)

⁷⁵ Xplornet Traffic Management Policy

www.xplornet.com/legal/xplornet-traffic-management-policy.aspx

⁷⁶ Xplornet Home Packages • www.xplornet.com/packages-home.aspx

⁷⁷ Xplornet Business Packages • www.xplornet.com/packages-business.aspx?PackageID=216

Addendum: Full Disclosure

This report was prepared by Joseph McLean and the team at Second Flux Information Services. As local residents, we use many of the Internet services that are listed in this report. The following relationships with Internet Service Providers are listed below, in the interests of full disclosure.

1. Joseph McLean & Second Flux use or have recently used services provided by Bell, MasterOne, Rogers, Shaw, and Telus, independently from this report.
2. The report was assisted by Telus, who provided an important piece of testing hardware without charge.
3. Joseph McLean & Second Flux have worked with Kevin Unger of MasterOne many times in the past, as well as Glen Roscovich, local installer for Xplornet.

None of the foregoing should effect the neutrality or conclusions of this report.

Appendix B: Testing methodology

A key goal in preparing this report was to understand the nature of cellular coverage in the Powell River Regional District. Published service maps show great coverage through much of the area, but the truth on the ground can be different, especially with a distance signal like cellular. Thanks to timely assistance from Telus⁷⁸, we were able to test this network just as it launched. The competing Rogers network was tested at the same time, using equipment already on hand.

Strict limits on time and budget required a basic testing methodology, which was not intended to be exhaustive. A Telus cellular modem⁷⁹ was used in conjunction with a modern laptop while driving the region. A simple 6' USB extension cord allowed the antenna to be sited high in the vehicle, near an inside window. At no time did the antenna protrude from the vehicle, so that testing was more equivalent to typical in-home use.

An Apple iPhone 3GS acted as a control test for the Rogers HSPA cellular network⁸⁰. The use of a smartphone rather than a USB modem likely did Rogers a disservice, as USB modems can be more powerful. Since the main purpose of the cellular survey was to find coverage gaps rather than compare individual speed and performance, we considered this approach adequate. A comprehensive test would have required two cars, two laptops, and multiple runs.

Environmental conditions can affect cellular signals in various ways, and even time of day can affect the network. While service was often measured twice, a comprehensive test would include multiple runs over several weeks, or even months — unrealistic for a report of this nature.

All tests focused on HSPA and HSPA+ cellular technologies. Rogers has long supported HSPA, and the older CDMA/1X technologies used by Bell/Telus are depreciated in favour of their new network. Residents who purchased Bell or Telus cellular modems before November 2009 are using the older technology, and are urged

⁷⁸ The author thanks Mike Black of Telus for generously providing an HSPA+ cellular modem for the duration of this test. Availability of this modem was extremely limited due to the recent launch. Thanks to the efforts of Mr. Black and Telus, one of the first users on this brand new network was our testing team.

⁷⁹ The Sierra Wireless 306 • www.telusmobility.com/en/BC/sierra_usb_306_modem/index.shtml

⁸⁰ Pre-existing Rogers HSPA service at 7.2 Mbps faced the Bell/Telus HSPA+ service at 21.1 Mbps.

to upgrade. With industry dropping support for these older technologies, we were comfortable not including these in our tests.

This survey did not visit the homes of any residents, again owing to time concerns. As we travelled the area, however, we did measure service beside the homes of some interested residents.

Given these limits, tests performed by our technicians were more than adequate to inform the survey, answering the important questions of cellular coverage in the district.

Appendix C: Maps

To illustrate our findings, colour Internet Access maps were developed for the district. The three maps are designed so that *minimum service levels* are shown for each area. For example, while cellular Internet exists in the City of Powell River, residents generally prefer wired service from Shaw, Telus and Uniserve. That is the service level shown on the map. Compare this to Craig Road in Area A. With few connectivity options, Craig Rd is colour-coded for cellular — the minimum service that exists in that area.

As discussed earlier, Xplornet's satellites have nearly universal access across the regional district: if it's on the map, chances are good that a satellite can reach it.

Wireless coverage strength is not considered on these maps, and small outage gaps are not shown. More comprehensive testing would be required to illustrate this accurately, and the resulting data would be complex. The maps are intended as a general overview of the area, where patterns are more important than meter by meter accuracy. This perspective allows coverage data to be presented cleanly and simply.

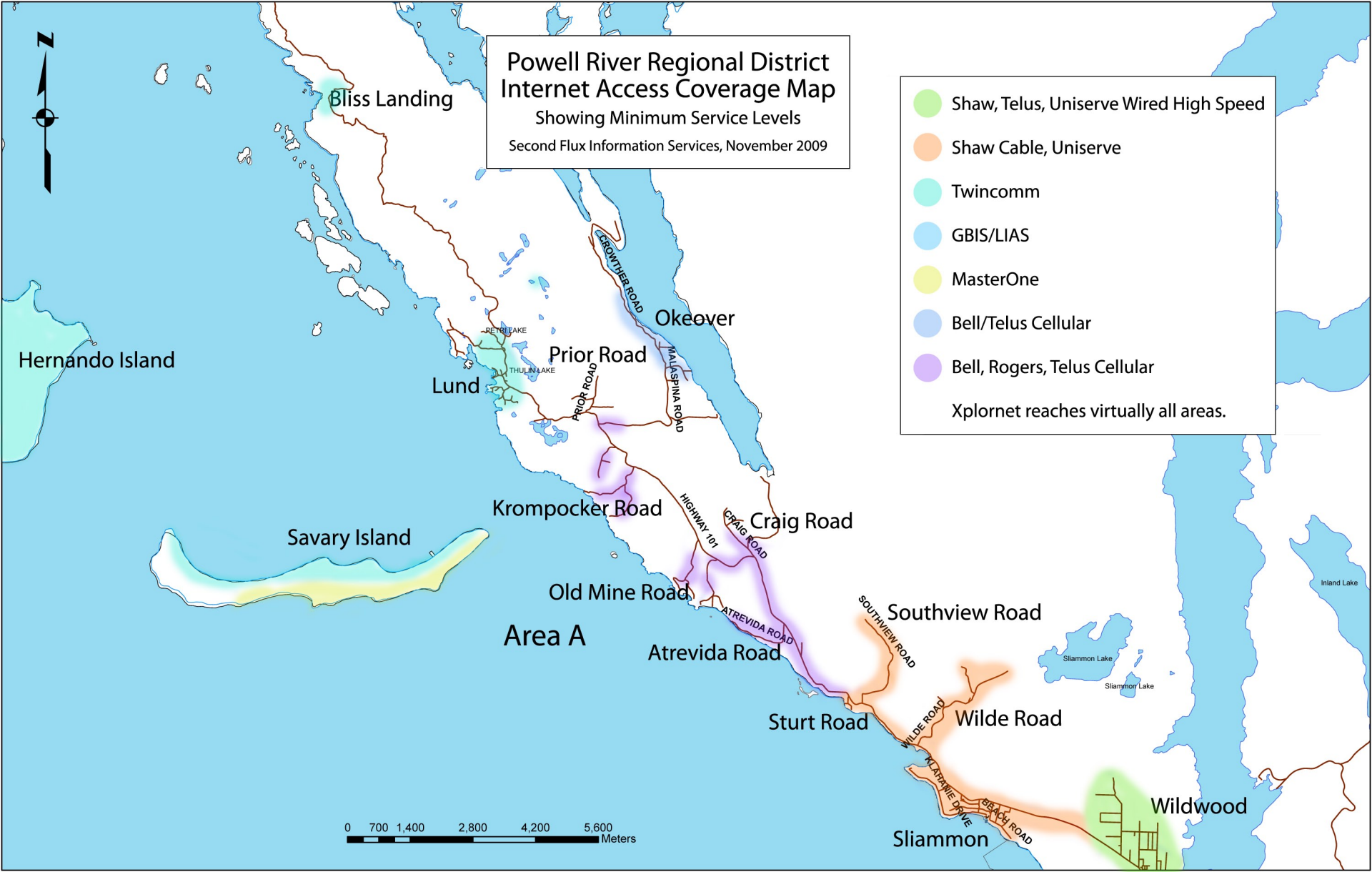
All data is based on our findings and area tests, and is current as of November 2009.

Powell River Regional District Internet Access Coverage Map

Showing Minimum Service Levels

Second Flux Information Services, November 2009

- Shaw, Telus, Uniserve Wired High Speed
 - Shaw Cable, Uniserve
 - Twincomm
 - GBIS/LIAS
 - MasterOne
 - Bell/Telus Cellular
 - Bell, Rogers, Telus Cellular
- Xplornet reaches virtually all areas.



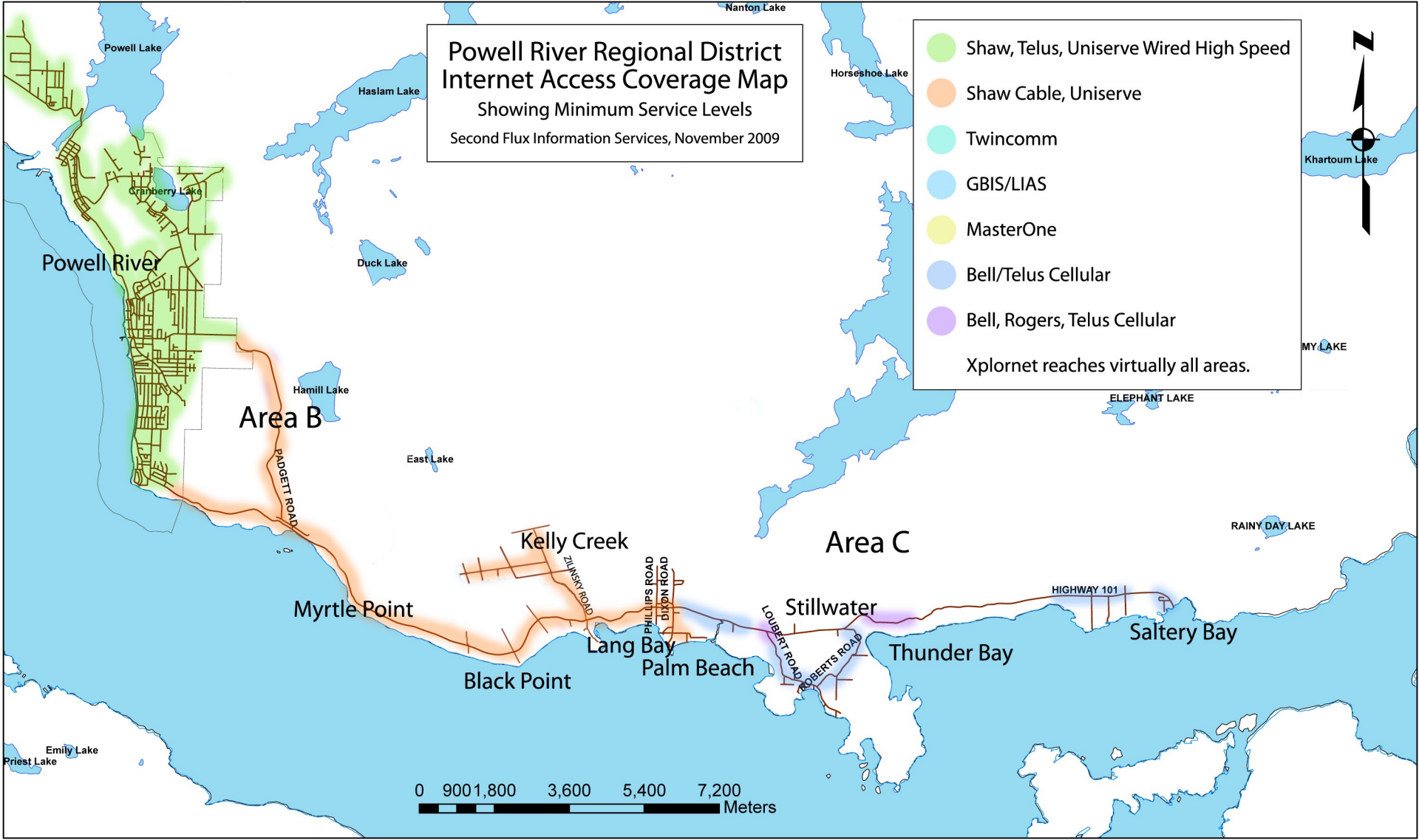
0 700 1,400 2,800 4,200 5,600 Meters

Powell River Regional District Internet Access Coverage Map

Showing Minimum Service Levels

Second Flux Information Services, November 2009

- Shaw, Telus, Uniserve Wired High Speed
 - Shaw Cable, Uniserve
 - Twincomm
 - GBIS/LIAS
 - MasterOne
 - Bell/Telus Cellular
 - Bell, Rogers, Telus Cellular
- Xplornet reaches virtually all areas.



Powell River

Area B

Area C

Myrtle Point

Kelly Creek

Stillwater

Saltery Bay

Black Point

Lang Bay

Palm Beach








Thunder Bay

0 900 1,800 3,600 5,400 7,200 Meters



Powell River Regional District Internet Access Coverage Map

Showing Minimum Service Levels
Second Flux Information Services, November 2009

-  Shaw, Telus, Uniserve Wired High Speed
 -  Shaw Cable, Uniserve
 -  Twincomm
 -  GBIS/LIAS
 -  MasterOne
 -  Bell/Telus Cellular
 -  Bell, Rogers, Telus Cellular
- Xplornet reaches virtually all areas.

