



**Lemay-Yates**  
**Associates**  
Inc.

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## Yukon Telecommunications Study

Report presented to:

Yukon Government  
Ministry of Business, Tourism and Culture

*June 2003*



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## **1. Executive summary**

This Report was prepared by Lemay-Yates Associates Inc. (LYA) on behalf of the Ministry of Business, Tourism and Culture of the Yukon Government.

A policy goal of the Yukon Government is to facilitate development of telecommunications infrastructure and services that meet the needs of Yukon consumers and businesses. This Report discusses the present and future needs for telecom services in the Yukon, and an assessment of network and infrastructure, competitive choices, competitive entry and the policy/regulatory framework.

The telecom industry in Canada has been experiencing low growth rates for the past several years. Total industry revenues in 2002 were approximately \$31.5 billion, including local, long distance, data, Internet and mobile services, up only 2% from 2001.

The industry structure in Canada has implications for telecom development in the Yukon. In addition to slower growth, many firms have exited the market, and the remaining competitors are still small compared to the large incumbent telephone companies. For the near to mid-term, therefore, Yukon consumers and businesses should not expect to see significant competitive entry in telecom, or significant levels of investment from parties that do not already presently operate in the Yukon.

The Yukon however is well-served in terms of basic wireline telecom infrastructure. Overall telephone penetration is on par with or ahead of the rest of the country. In terms of Internet take-up, consumers in the Yukon have tended to lead the rest of the country with penetration at about 50% of households.



Unlike consumer Internet take-up, private sector business use of the Internet has been lagging (but catching up with) the rest of Canada. Internet is a growing and important need particularly amongst small and medium businesses. The growth in high-speed service, and the appetite for competitive offer shows the dynamic of this segment elsewhere in Canada, given the “right” price and service offer.

As part of the development of this Report, LYA consulted end user business customer organisations in Yukon, as well as telecom and Internet service providers. The key findings are:

- **Business customers:** Businesses have seen significant progress in telecom development in the Yukon. This is reflected in comments on the broad availability of DSL access as well as on the observation that retail pricing in general seems to have declined. On the other hand, the business users have seen no evidence of telecom competition, other than at the level of retail Internet services. All of the organisations interviewed make use of high-speed DSL or cable modem services. Some use dial-up service in locations other than Whitehorse. It was identified that although there is high-speed local connectivity covering most of the Yukon, the bandwidth available within the Yukon and between communities can be insufficient and/or too costly and in some cases too unreliable to support high-end applications. It was also identified that there are limited connections and capacity in/out of Yukon to rest of Canada. With the continued increase in the use of Internet and development of applications, there will be an increasing need for connectivity. Mobile service was identified as being inadequate; both coverage of the present mobile network as well as the lack of roaming for business travellers.
- **Telecom operators:** None of the telecom operators interviewed identified plans to enter the Yukon telecom market. The level of contribution paid to Northwestel was identified as a barrier to entry in the long distance market (which was opened to



competition in 2000). In addition to the direct cost of interconnection, there is also a carrier access tariff (CAT) charge, which by itself in some cases can exceed the retail rate paid by the end customer.

- Internet providers: Competition in Internet services is relatively vibrant. In addition to Northwestel, there are four other ISPs. YKNet (the original Internet provider in the Yukon) serves most communities in the Yukon. Polarcom is in Whitehorse as well as areas such as Dawson and Marsh Lake. Microage operates in Whitehorse as does WHTV. WHTV is the local cable television company, which provides Internet service using cable modems. In terms of the development of the ISPs and future applications, the structure of wholesale pricing is as an impediment. The ISPs interviewed identified that the sum of the wholesale services required to operate can exceed the retail price.

Development of infrastructure would be beneficial to the development of telecom services in the Yukon, particularly given the growing needs for business applications using the Internet, and the need for greater mobile capabilities.

Based on these considerations, and on the research findings, the following three areas should be the focus of future initiatives in telecom development:

- Wireline facilities and competition in the Yukon. The question of facilities across the Yukon and competitive development should be considered as one focusing on the regulatory framework and the support provided to Northwestel via various mechanisms that promote the upgrade and expansion of facilities and capabilities. At the same time, the regime needs to ensure that opportunities are present for the emergence of local initiatives where viable. Regulatory action should be taken to “correct” wholesale pricing where it exceeds retail rates – particularly for long distance and Internet services. Since Northwestel’s wholesale and retail rates are both



regulated and Northwestel's rate of return is also regulated, a viable and reasonable wholesale/retail structure should be achievable.

- High capacity link to the south. This would focus on increased capacity in and out of the Yukon (i.e. from Whitehorse south). There are at least three socioeconomic benefits of a high speed link to the south. It would (1) enable local businesses for e-commerce to promote export of Yukon-based goods and services. It would (2) help build up local IT firms and expertise, and (3) support advanced applications in health, education and government services. This link would remove a major cost element of doing business for telecom and Internet companies in the Yukon. It would facilitate connection to the national backbone networks – voice, data, mobile – providing service providers (including Northwestel) with the capability of offering new services and platforms, which in turn could have a stimulating effect and be an important lever for development of the local economy. The link should be considered as part of the basic infrastructure serving the Yukon, in a similar way that modern airports and highways promote development of local business and tourism.
- Mobile network coverage and capabilities. Mobile networks can be built locally at a reasonable cost, however, to fully enable mobile services, advanced platforms are required (e.g. for billing, SMS, data and Internet access, signalling, etc.). Mobile service is highly dependent on the availability of backhaul facilities for traffic as well as for connection to these systems and platforms. To some extent, therefore, the development of added mobile capability converges with the question of the link to the south. The link could provide access for mobile carriers (including Northwestel) to leverage existing investment in advanced infrastructure elsewhere (e.g. in 2.5G networks of GPRS and 1XRTT technology), and thus promote incremental coverage investments to meet the market need in the Yukon.



The high capacity link to the south would be a key development supporting both the development of Internet services and applications as well as more advanced mobile networks in the Yukon. As the needs and applications grow, the present Northwestel facility will be strained to the point where it will need to be upgraded or supplemented anyway. In that case, this provides a trigger for an alternative approach to building something new, which could involve the participation of third parties.

Recognising that the private sector is unlikely to develop the project on its own, and consistent with its policy to support industry development, the Yukon Government could take a role in development of this new facility. It could stimulate development of a project wherein a third party would develop the link to the south. This third party could be a consortium of interests including Northwestel and others. The mandate of the third party would be to find funding and partnering arrangements and opportunities (e.g. from future highway, electricity, pipeline, etc. projects) to support development of the link. The mandate would also include competitively neutral access to the capacity of the link once it is built, supporting development of new services and applications particularly focused on Internet and mobile services.





## 2. Introduction

This Report was prepared by Lemay-Yates Associates Inc. (LYA) on behalf of the Ministry of Business, Tourism and Culture of the Yukon Government.

A policy goal of the Yukon Government is to facilitate development of telecommunications infrastructure and services that meet the needs of Yukon homes and businesses.

In a 1997 Report, it was observed that the Yukon was behind in terms of the evolution of the communications industry, and that Yukoners feel disadvantaged. For Yukon-based businesses, this means increased relative costs of operating in the Yukon as well as limiting ability to move into markets outside the Yukon. On the other hand, it was also recognised that new infrastructure development would require “a realistic planning horizon”, as well as development of long-term strategy and co-ordination.<sup>1</sup>

This Report discusses the present and future needs for telecom services in the Yukon, and an assessment of network and infrastructure, competitive choices, competitive entry and the policy/regulatory framework.

This is done firstly by providing a review of the state of the Canadian telecom industry in general, then considering the past development of telecom facilities and services in the Yukon relative to the rest of the country. The Report then provides inputs from business customer groups and service providers that were interviewed as part of this project, and concludes in terms of key findings from the research as well as recommendations for future development.

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<sup>1</sup> See Part One of “Report on Telecommunications in the Yukon, September 29, 1997”, Liora Salter, Bradley Phillips, prepared for the Yukon Government



### 3. The state of the telecom industry in Canada

The telecom industry in Canada has been experiencing low growth rates for the past several years. Total industry revenues in 2002 were approximately \$31.5 billion, including local, long distance, data, Internet and mobile services, up only 2% from 2001.

#### 3.1 Overall results and trends

Industry segmented revenues as they have evolved since 1998 are shown below.<sup>2</sup>

**Table 1 – Evolution of Canadian telecom industry revenues**

| <i>Canadian market summary (\$M)</i>              | 2002                   | 2001            | 2000            | 1999            | 1998      |
|---|------------------------|-----------------|-----------------|-----------------|-----------|
| Total<br>(including residential and business)     | \$ 31,557<br>2% growth | \$ 30,937<br>8% | \$ 28,639<br>8% | \$ 26,479<br>9% | \$ 24,377 |
| Long distance voice                               | \$ 6,913<br>-5% growth | \$ 7,306<br>-7% | \$ 7,826<br>-8% | \$ 8,498<br>-6% | \$ 9,085  |
| Data (excluding Internet)                         | \$ 5,595<br>2% growth  | \$ 5,462<br>18% | \$ 4,641<br>27% | \$ 3,642<br>46% | \$ 2,502  |
| Internet<br>(telecom providers and cablecos only) | \$ 2,503<br>33% growth | \$ 1,888<br>50% | \$ 1,258<br>54% | \$ 816          | \$ -      |
| Local and access                                  | \$ 9,519<br>-5% growth | \$ 10,051<br>5% | \$ 9,551<br>6%  | \$ 8,971<br>-2% | \$ 9,191  |
| Mobile  | \$ 7,027<br>13% growth | \$ 6,229<br>16% | \$ 5,363<br>18% | \$ 4,553<br>20% | \$ 3,780  |

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High growth market segments are Internet and mobile. The more traditional local and long distance services have been relatively flat in terms of revenue growth since 1998. The Internet and data services market is moving towards becoming as big as the local access market, and in 2002 mobile services surpassed long distance. In addition to being sources of growth in revenues, the Internet and mobile segments are areas which will also be important areas for future investment by telecom companies.

<sup>2</sup> As per Company Reports and estimates of Lemay-Yates Associates Inc. Note – the Internet segment represents the Internet revenues of telecom carriers and cable television companies only.



### 3.2 *Data services*

For the last 18 months, the data market has suffered considerably and has grown much less quickly than the industry expected when it was experiencing the high growth rates in the 1998 to 2000 timeframe.

A major driver for data services growth was expected to be the increased consumption of data services by small and medium enterprises (SMEs) – which represent the vast majority of business customers.

However, SME data requirements are largely being addressed by Internet services. In other words, SME's can make use of the public Internet infrastructure to facilitate development of on-line presence and e-commerce and do not need the conventional “data” services – private line, frame relay, etc. – that large enterprises use.

Hence the once-anticipated SME market for data services is largely represented by the Internet segment, which is continuing to grow at double-digit rates.

Another factor impacting the data market has been the demise of many new entrant telecom carriers.

These new entrants were anticipated to represent a continuing source of growth for wholesale data services. The exit from the market of many telecom entities has resulted in a drying up of the market for wholesale data services.

The “bright side” for the industry is the growth of Internet and mobile.



### 3.3 High speed Internet

Cable television companies have a leading role in the development of high-speed Internet. The telephone companies – also referred to as incumbent local exchange carriers or ILECs – had developed DSL technology, but it was not until cable companies introduced cable modem service that the high-speed Internet market began to take shape.

Cable has continued in the role of stimulator of the high-speed market, with increasing numbers of cable subscribers also subscribing to cable modem service. Cable modem subscriptions in Canada grew by 33% from 2001 to 2002, as shown below.

**Table 2 – Canadian cable modem subscriber growth**

|           | 2002      | 2001      | Growth |
|-----------|-----------|-----------|--------|
| Rogers    | 683,874   | 478,800   | 43%    |
| Shaw      | 807,810   | 703,806   | 15%    |
| Videotron | 361,220   | 229,000   | 58%    |
| Cogeco    | 182,067   | 130,683   | 39%    |
| Persona   | 26,019    | 9,683     | 169%   |
| Total     | 2,060,990 | 1,551,973 | 33%    |

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Interestingly, high-speed Internet subscribers now represent some 40% of cable subscribers in the case of Shaw Cable and 30% in the case of Rogers Cable.<sup>3</sup>

In terms of absolute numbers, DSL services are “catching up” with cable modem. In 2002, Telus DSL subscribers grew by 91% and Bell Canada’s by 47%, so that by the end of the year, they had a total of 1.5 million subscribers.

<sup>3</sup> Per Company Quarterly Reports, February and March 2003, respectively.



### 3.4 Mobile services

Mobile penetration continues to increase. By the end of 2002, mobile subscriptions represented 38% of the Canadian population, as shown below.<sup>4</sup>

**Table 3 – Evolution of Canadian mobile subscribers**

|                    | 2002              | 2001              | 2000             | 1999             | 1998             | 1997             | 1996             |
|--------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|
| Bell Alliance      | 4,421,065         | 3,907,450         | 3,116,553        | 3,586,377        | 2,989,000        | 2,494,000        | 2,038,000        |
| Microcell          | 1,164,521         | 1,209,210         | 922,527          | 584,487          | 282,174          | 65,667           | 2,030            |
| Telus Mobility     | 2,987,800         | 2,570,000         | 2,156,200        | 559,331          | 308,473          | 95,225           | 5,065            |
| Rogers Wireless    | 3,355,900         | 2,991,900         | 2,513,900        | 2,153,000        | 1,737,600        | 1,552,127        | 1,369,616        |
|                    | -                 | -                 | -                | -                | -                | -                | -                |
| <b>Total</b>       | <b>11,929,286</b> | <b>10,678,560</b> | <b>8,709,180</b> | <b>6,883,195</b> | <b>5,317,247</b> | <b>4,207,019</b> | <b>3,414,711</b> |
| <i>Growth</i>      | <i>12%</i>        | <i>23%</i>        | <i>27%</i>       | <i>29%</i>       | <i>26%</i>       | <i>23%</i>       | <i>n/a</i>       |
| <i>Penetration</i> | <i>38%</i>        | <i>34%</i>        | <i>28%</i>       | <i>22%</i>       | <i>18%</i>       | <i>14%</i>       | <i>11%</i>       |

Source: CWTA; 2002 based on 3rd qtr; Bell Alliance includes Aliant, Sasktel, MTS, NWTel, and some small carriers  
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Growth in mobile has slowed but is still in the double-digit range. Overall penetration in Canada has tended to lag that of other countries. The US is at about 50%, Australia 65% and Sweden 85%.

Figure 1 shows the presence of mobile service providers across Canada. The figure shows the focus of mobile development on areas of the country where there is the greatest economic imperative.<sup>5</sup>

There are also “pockets” of mobile development based on specific needs or market situations. For example, Telus has built out the area around Fort St. John with its dispatch-type MiKE service to provide support to oil and gas sector firms. Another example is Inuvik, where New North Networks operates a cellular service competing with Northwestel.

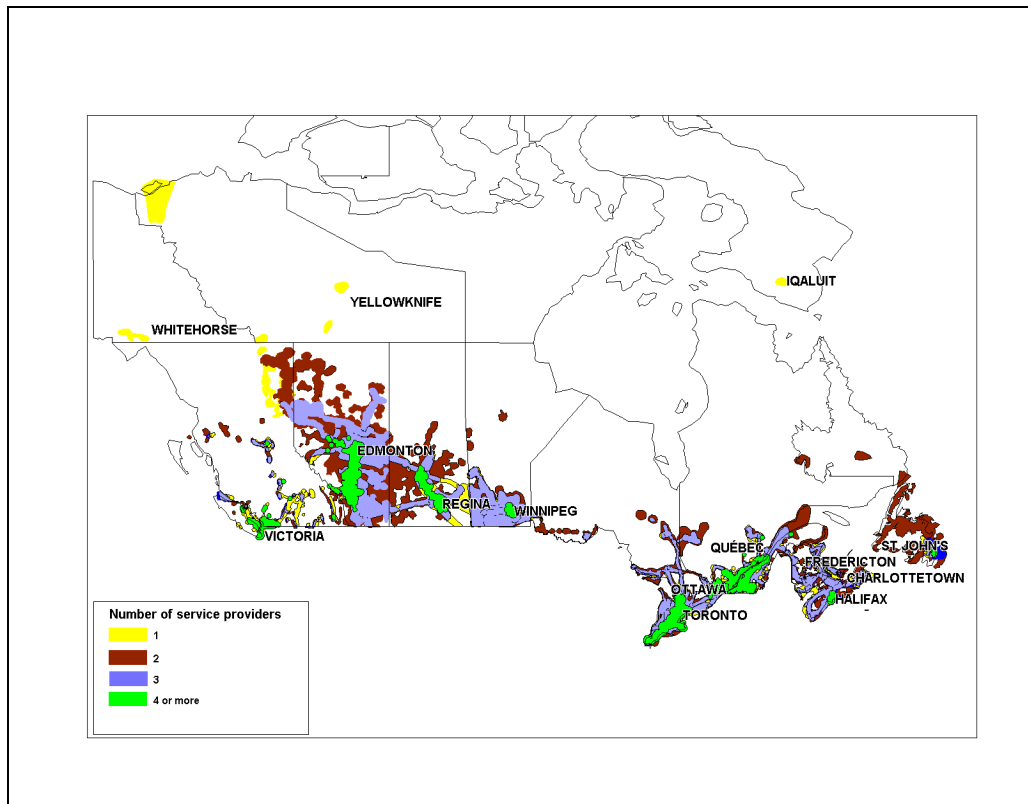
<sup>4</sup> Per Canadian Wireless Telecommunications Association (CWTA).

<sup>5</sup> Per “Report on the Status of Competition in Canadian Telecommunications Markets and the Deployment and Accessibility of Advanced Telecommunications Infrastructure and Services” CRTC, December 2002



The figure below also illustrates the level to which many areas are under-served for mobile. This is the case with Yukon where there is a presence of one provider (Northwestel) in Whitehorse.

**Figure 1 – Presence of mobile service providers across Canada**



*Per CRTC, December 2002*



### 3.5 *Industry landscape*

The Canadian industry overall remains largely dominated by the large incumbent telcos (ILECs) and particularly by BCE-affiliated entities (including Northwestel).<sup>6</sup>

In the wireline market segments – local, long distance, data, Internet – the ILECs have retained a commanding 80%+ market share in revenue terms, as shown below.

**Table 4 – Incumbent versus competitor revenue share**

|                               | 2002      |     | 2001      |     |
|-------------------------------|-----------|-----|-----------|-----|
| Incumbents                    | \$ 17,119 | 81% | \$ 17,351 | 81% |
| Competitors (including cable) | \$ 4,070  | 19% | \$ 4,000  | 19% |
| Total (wireline) \$M          | \$ 21,189 |     | \$ 21,351 |     |

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The incumbent share of the market is even higher in particular segments such as local lines, overall residential services and in large business accounts.

ILEC dominance in market share also comes with dominance in financial results, summarised below, illustrated by comparison of industry EBITDA (earnings before interest, taxes, depreciation and amortisation – effectively operating cash flow) versus capital expenditures.

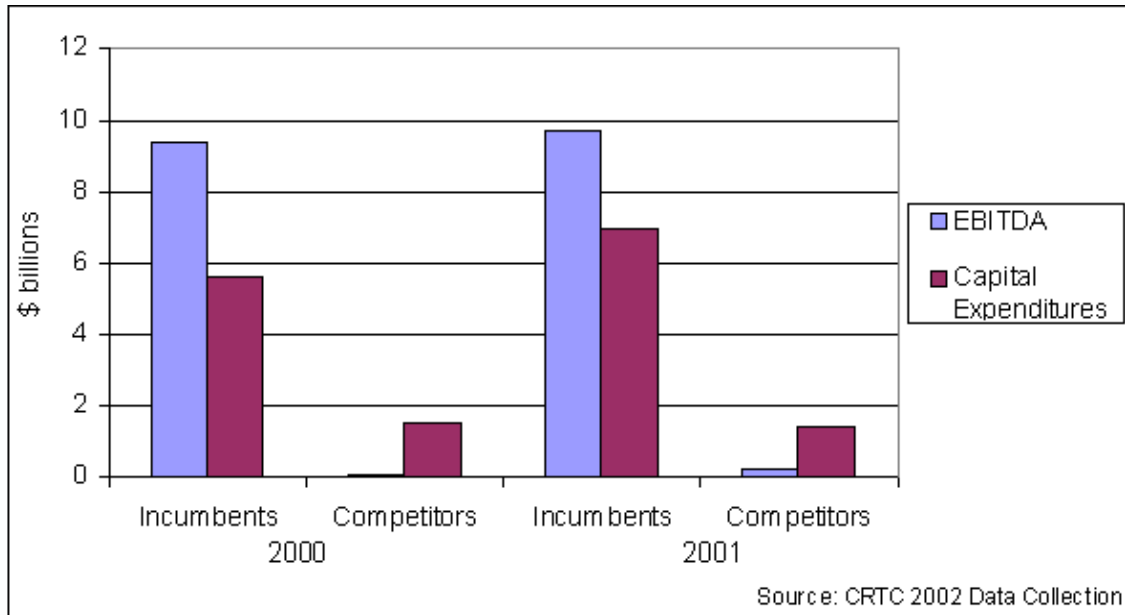
The EBITDA for incumbents as a group compared to competitors as a group for 2000 and 2001 is shown below.<sup>7</sup>

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<sup>6</sup> BCE (Bell Canada Enterprises) owns Bell Canada, the countries largest ILEC serving Ontario and Quebec, which includes Bell Mobility. Northwestel is in effect part of Bell Canada. BCE also is the largest shareholder in Aliant and a minority owner of Manitoba Tel. BCE also owns Bell ExpressVu which provides direct-to-home satellite services, which competes with cable companies, and via Bell Globemedia owns the CTV television network and national newspaper the Globe and Mail.



**Figure 2 – Financial results – ILECs versus competitors**



The ILECs typically generate more operating cash flow than is needed to invest in network assets – i.e. they are profitable. Competitors on the other hand typically have financing needs that are greater than their operating cash flow.

Shown another way, the following figure compares the cumulative (1998 to 2002) total financing from all sources for Bell Canada and Telus as a group compared to the largest competitors (AT&T Canada, Call-Net and GT Group Telecom) as a group.<sup>8</sup>

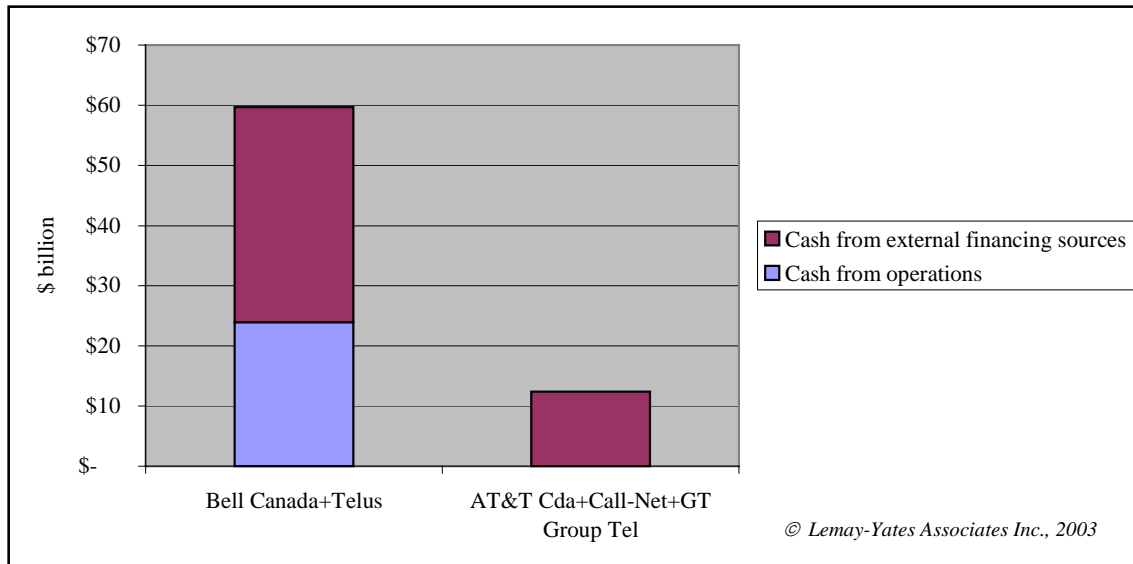
<sup>7</sup> Per “Report on the Status of Competition in Canadian Telecommunications Markets and the Deployment and Accessibility of Advanced Telecommunications Infrastructure and Services” CRTC, December 2002

<sup>8</sup> Source: per Company Annual Reports, analysis per LYA





**Figure 3 – Comparison of financing sources – ILECs versus competitors**



Canadian competitors remain relatively small. In addition, the telecom shakeout of the past few years has resulted in there being many fewer competitors. In 2000, major markets such as Toronto had 20 or more competitors (in all market segments) entering or planning entry. This declined by 50% in 2001.

The industry structure in Canada – now characterised by slower growth, with many firms having exited the market, and with competitors remaining relatively small – has implications for telecom development in the Yukon. For the near to mid-term, Yukon consumers and businesses should not expect to see significant competitive entry in telecom, or significant levels of investment from parties that do not already presently operate in the Yukon.



## 4. Yukon compared to other regions of Canada

### 4.1 Overall network indicators and revenues

In Canada the basic service objective underlying the present network provides for individual line service, including the “capability to connect via low-speed data transmission to the Internet at local rates”.<sup>9</sup>

Given this objective, the Yukon is well-served in terms of the minimum basic telecom infrastructure. Overall basic service penetration is on par with or ahead of the rest of the country. This is shown below, where the number of telephone access lines in Yukon is estimated from Northwestel’s overall figures.<sup>10</sup>

**Table 5 – Yukon teledensity compared to Canada overall**

|                      | 1996   | 1997   | 1998   | 1999   | 2000   | 2001   |
|----------------------|--------|--------|--------|--------|--------|--------|
| Yukon % of NWTel     | 32%    | 31%    | 31%    | 31%    | 31%    | 30%    |
| Yukon access lines   | 25,493 | 26,934 | 28,203 | 29,581 | 30,013 | 31,022 |
| Yukon population     | 30,000 | 29,633 | 29,266 | 28,899 | 28,532 | 28,165 |
| Yukon - Teledensity  | 85     | 91     | 96     | 102    | 105    | 110    |
| Canada - Teledensity | n/a    | 77     | 82     | 88     | 96     | 100    |

*Total access lines (residential, business, mobile); Teledensity is lines per 00 population*

*Canada - Teledensity figures per CRTC, Report to Governor in Council, December 2002*

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Teledensity – total access lines over the total population – for Yukon was at 110 in 2001 compared to 100 for Canada overall.

<sup>9</sup> Per Telecom Decision CRTC 99-16, cited in Telecom Decision CRTC 2000-746, paragraph 4

<sup>10</sup> Yukon teledensity estimated by LYA. Note – The proportion of lines in Yukon is based on % of households represented by the Yukon relative to Northwestel’s operating territory using 1996 and 2001 Census information.



Part of the reason for the higher ratio for Yukon versus rest of Canada could be the greater proportion of business lines in the Yukon. This proportion is greater in the North than in the rest of Canada (per Northwestel), perhaps among other things due to the relatively greater reliance on communications given the North’s geographic remoteness.<sup>11</sup>

Prices in the Yukon are typically higher than they are in the rest of Canada. This translates into greater average revenues per access line, as shown below.

**Table 6 – Yukon average revenue per line per month compared to Canada overall**

|                                     | 1996       | 1997       | 1998       | 1999       | 2000       | 2001       |
|-------------------------------------|------------|------------|------------|------------|------------|------------|
| Northwestel                         | \$ 131     | \$ 127     | \$ 124     | \$ 125     | \$ 128     | \$ 120     |
| Bell Canada                         | \$ 80      | \$ 93      | \$ 91      | \$ 91      | \$ 94      | \$ 101     |
| <i>Northwestel relative to Bell</i> | <i>64%</i> | <i>36%</i> | <i>37%</i> | <i>38%</i> | <i>36%</i> | <i>19%</i> |

*Note - Total revenues (including mobile) per fixed access line*

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The higher revenues per line are reflected in higher pricing for a number of services.

Business high-speed DSL-based Internet service, for example, has typically been priced at \$160, much higher than the \$60-\$80 range seen in the rest of Canada. Lower priced DSL services are becoming available in Whitehorse, at below \$100 per month. Consumer high-speed Internet is also typically priced higher than elsewhere in Canada – in the range of \$60 per month as compared to \$45 to \$50 elsewhere. These prices though also appear to be declining. WHTV, for example, offers cable modem service in Whitehorse for \$30 to \$50 per month. Business long distance pricing is typically 19 cents per minute, about double the typical price elsewhere in Canada.<sup>12</sup>

<sup>11</sup> Note – Figures are shown up to 2001 as this is the most recent published data for Northwestel as of mid-May 2003.

<sup>12</sup> Northwestel pricing for day time calling in Canada. Lower rates are available in service bundles – e.g. residential evening and weekend calling is 10 cents per minute.



## 4.2 Investment in network

By the same token, it costs more on average to own a telecom network in the Yukon compared to the rest of the country.

This is due to the greater distances involved for building routes, the lower population density, as well as higher unit costs related to construction in remote areas. As a result, Northwestel's gross fixed assets (expressed on a per-line basis) are some 40% higher than that of Bell Canada, as shown below.

**Table 7 – Comparative gross fixed network assets per line**

|                                     | 2001       |
|-------------------------------------|------------|
| Northwestel                         | \$ 4,147   |
| Bell Canada                         | \$ 2,935   |
| <i>Northwestel relative to Bell</i> | <i>41%</i> |

*Excluding land, buildings and spectrum license*

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Historically, Northwestel's capital spending as a % of revenue was higher than that of Bell Canada (up to 53% higher in 1997). Recent overlay funding (\$15 million in 2001) has helped reduce the burden of ongoing investment requirements. Northwestel now spends an amount of money on capital investment per year that is more comparable to Bell Canada overall, as illustrated below.

**Table 8 – Comparative capital expenditure relative to revenues**

| Capex % of revenues                 | 1996       | 1997       | 1998       | 1999       | 2000       | 2001      |
|-------------------------------------|------------|------------|------------|------------|------------|-----------|
| Northwestel                         | 27%        | 28%        | 25%        | 22%        | 20%        | 31%       |
| Bell Canada                         | 20%        | 18%        | 21%        | 20%        | 22%        | 29%       |
| <i>Northwestel relative to Bell</i> | <i>31%</i> | <i>53%</i> | <i>20%</i> | <i>10%</i> | <i>-7%</i> | <i>7%</i> |

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### 4.3 *Consumer Internet service*

In terms of Internet service take-up, consumers in the Yukon have tended to lead the rest of the country. By 1999, Internet use from home had already achieved a higher penetration in the Yukon than in the rest of Canada.

**Table 9 – Internet use from home**

|        | 1998  | 1999  |
|--------|-------|-------|
| Yukon  | 32.9% | 40.7% |
| Canada | 24.8% | 33.1% |

*Statistics Canada - Spending Patterns  
1998 and 1999; Catalog 62-002*

Continued growth in consumer Internet has been supported by the widescale deployment of DSL technology in the Connect Yukon project. Internet access in the North provides consumers with a feeling of being “connected” to the rest of the world, despite their remote location. This is also likely a stimulator of Internet usage.

Canadian household Internet penetration is now in the range of 50%. Although based on incomplete information, penetration in the Yukon appears to be approximately tracking the rest of Canada now.



#### 4.4 Business Internet and data services

Unlike consumer Internet, however, up to 2001 private sector business use of the Internet has been lagging the rest of Canada.

**Table 10 – Enterprises using the Internet**

|  | Yukon | Canada |       |
|--|-------|--------|-------|
|  | 2001  | 2001   | 2002  |
| Total Public Sector                              | n/a   | 99.7%  | 99.6% |
| Total Private Sector (breakdown below)           | 52.4% | 70.8%  | 75.7% |
| Agriculture                                      | 50.0% | n/a    | n/a   |
| Forestry, Logging & Support                      | n/a   | 68.2%  | 64.3% |
| Mining   | 30.3% | 77.6%  | 81.8% |
| Utilities (Yukon - includes Manufacturing)       | 55.9% | 93.7%  | 93.0% |
| Construction                                     | 43.1% | 70.5%  | 68.5% |
| Manufacturing                                    | n/a   | 82.4%  | 88.5% |
| Wholesale Trade                                  | 48.6% | 81.7%  | 86.0% |
| Retail Trade                                     | 56.0% | 65.2%  | 72.1% |
| Transportation & Warehousing                     | 43.6% | 57.4%  | 63.7% |
| Information & Cultural                           | 84.8% | 92.9%  | 96.7% |
| Finance & Insurance                              | 78.8% | 82.0%  | 78.5% |
| Real Estate (Canada - includes rental, leasing)  | 30.9% | 53.4%  | 64.7% |
| Rental & Leasing Services                        | 35.1% | n/a    | n/a   |
| Prof, Scientific, Technical                      | 75.5% | 90.7%  | 92.4% |
| Management of Companies & Enterprises            | n/a   | 63.1%  | 59.0% |
| Admin & Support (Canada - includes waste mgt)    | 44.2% | 80.0%  | 73.1% |
| Waste Mgmt & Environment                         | 46.2% | n/a    | n/a   |
| Educational Services (private sector)            | 68.3% | 93.0%  | 94.9% |
| Health Care & Social Assistance (private sector) | 50.4% | 70.4%  | 74.6% |
| Arts, Entertainment, Recreation                  | 69.6% | 81.5%  | 86.7% |
| Accommodation & Food Services                    | 52.6% | 48.0%  | 58.1% |
| Other Services                                   | 33.7% | 58.6%  | 67.6% |

*Yukon per "Yukon Business Survey 2001"*

*Canada per Statistics Canada, "Electronic Commerce and Technology 2002", April 2, 2003*

*© Lemay-Yates Associates Inc., 2003*

The difference between the Yukon and the rest of Canada varies depending on the sector of economic activity. In some sectors – e.g. information and cultural, retail, finance – the



lag is marginal (5% to 10% below Canada average), and in others it is quite high – e.g. wholesale, construction, mining, etc.

While the sectors that lag are more “industrial”, the Internet can be an important lever for businesses to remove distance factors and to promote direct links with customers. These attributes are at least as – if not more – important to Yukon-based businesses as they are to businesses elsewhere in Canada.

Recent information indicates that Yukon businesses may be catching up with the rest of the country. In a survey conducted in March 2003, it was found that over three quarters of Yukon enterprises use the Internet.<sup>13</sup> This is similar to the level overall in Canada for 2002 (see Table 10, above).

LYA has conducted independent surveys elsewhere in Canada. In these it was found that more than 95% of small and medium enterprises (SMEs) had Internet access.<sup>14</sup> High Speed Internet access is progressing at a rapid pace among Canadian SMEs.

As highlighted below, among the target firms for the LYA survey, approximately 85% used High Speed Internet access in 2002, up from approximately 55% in 2001. This represents a major shift among this segment and one that bodes well for the future development of e-commerce and other web-based applications.

This increase in HS Internet penetration was accomplished at the expense of dial-up and ISDN lines which both experienced a significant decline from 2001 to 2002.

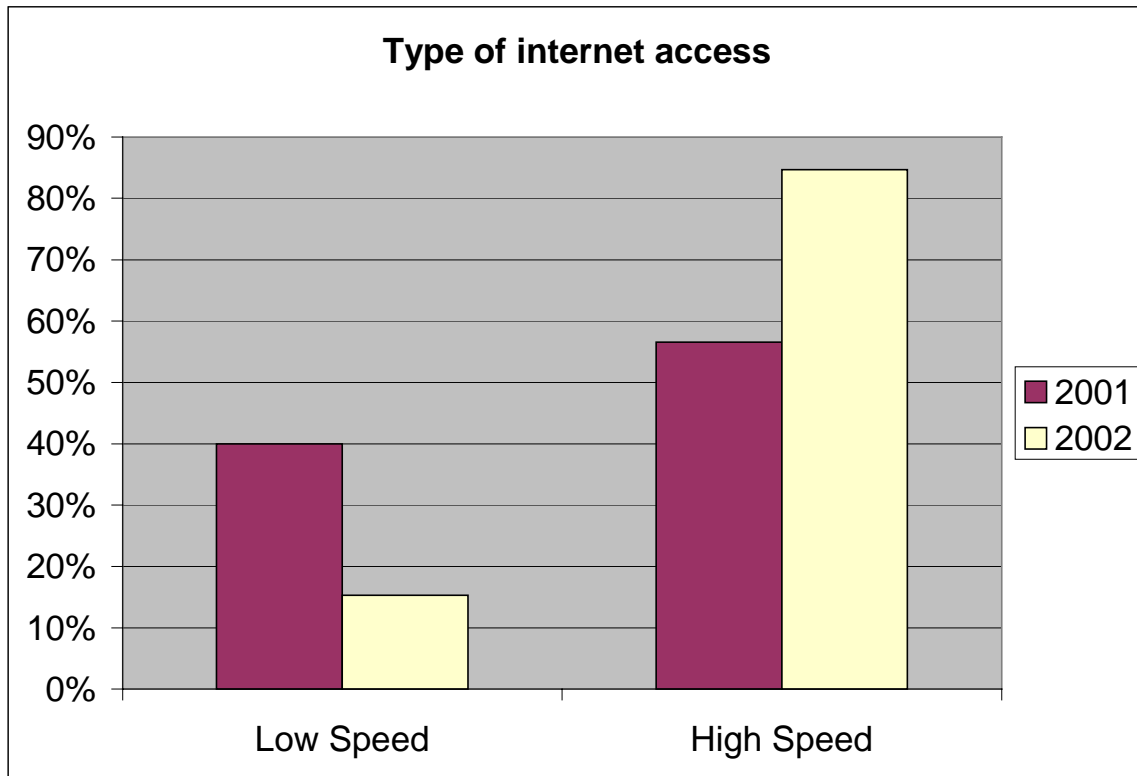
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<sup>13</sup> IT business survey (draft), which interviewed 150 business and non-profit organisations in the Yukon.

<sup>14</sup> Where SME's were considered to be firms with 5 to 250 employees. See: “Telecom Services for Small and Medium Enterprises in Canada 2003”, LYA International Inc., 2003. See [www.LYA.com](http://www.LYA.com).



**Figure 4 – 2002/2001 Evolution of HS Internet Access among SMEs**



Source: *Telecom Services for Small and Medium Enterprises in Canada 2003*, LYA International Inc.  
© Lemay-Yates Associates Inc.

DSL is the technology of choice among Canadian SMEs. However, cable modems and T1 access as well as other technologies such as Ethernet and broadband fixed wireless access appear to be on the increase.

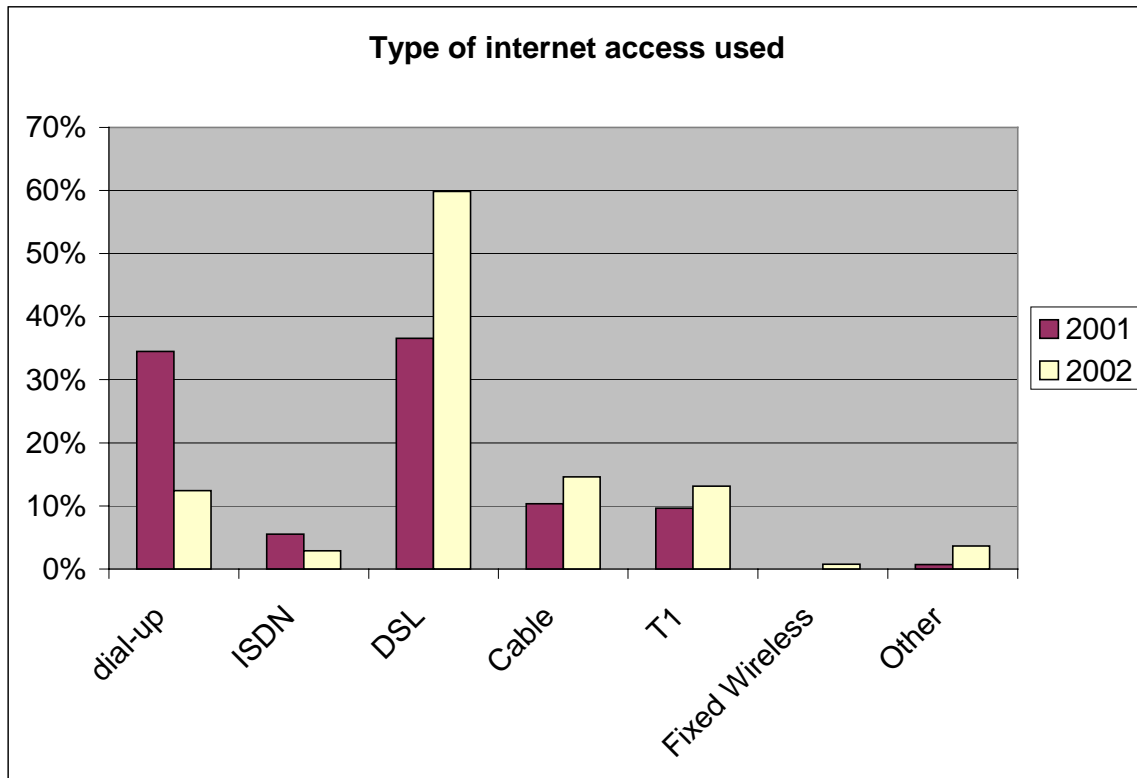
The high growth in high-speed Internet usage amongst small business is undoubtedly linked to the lower pricing that has become available for DSL access – the \$60 to \$80 per month range.

As the following figure also shows, the growing presence of competition for high-speed access (i.e. from cable television companies) is also becoming an important factor in the industry landscape.





**Figure 5 – 2002/2001 Evolution of the Internet access technology**



Source: *Telecom Services for Small and Medium Enterprises in Canada 2003*, LYA International Inc.  
© Lemay-Yates Associates Inc.

More than half of the firms with Internet access indicated that their current service is DSL based. Of these, 97% indicated they were using an ADSL service while just a few indicated that they were using a SDSL service. Close to 15% of the firms surveyed indicated that they used an Internet cable modem service.

Internet is a growing and important need particularly amongst small and medium businesses. The growth in high-speed service, and the appetite for competitive offer shows the dynamic of this segment, given the “right” price and service offer. Development of high speed Internet can be an important stimulator to the small and medium business sector, and an area that will should be a focus for the Yukon.



## 5. Yukon market research results

As part of the development of this Report, LYA consulted end user customer organisations in Yukon, as well as telecom and Internet service providers.<sup>15</sup> The detailed inputs received from these organisations are provided in confidence in the Appendices.

### 5.1 *Business customers*

All of the interviewees rely on Northwestel for local, long distance and data services. The only exception identified was the Federal Government (GTIS) contract that uses Telus for long distance services across Canada, including the Yukon.

Thus although Telus did not specifically enter the Yukon market it has a presence due to this contract. No other telecom competitors were identified.

In terms of Internet services, on the other hand, businesses make use of all of the service providers that are present in the market. The ISPs serving the Yukon in addition to Northwestel are YKNet, WHTV, Microage and Polarcom.<sup>16</sup>

Business customers make limited use of mobile services, reflecting primarily the lack of coverage. In addition, for incoming business travellers, the present mobile network does not necessarily support roaming (depending on which provider the traveller uses in his/her home market).

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<sup>15</sup> LYA conducted 11 end-customer interviews and 11 telecom or Internet service provider interviews.

<sup>16</sup> YKNet was the original non-profit entity that established Internet services in the Yukon. Northwestel had been a consortium member of YKNet initially but withdrew and now provides Internet services on a commercial basis using the Sympatico brand developed by Bell Canada.



The under-development of the mobile network has a double impact – on the ability of local business to make use of mobile services and capabilities, and on the ability of business travellers to use the network.

Expenditures on telecom service (albeit the LYA sample of customers is small) amongst the interviewees averaged \$170 per employee per month, including local, long distance, data, Internet and mobile services.<sup>17</sup> This is 60% higher than the average of \$104 obtained by LYA in its broader 2002 survey of Canadian businesses.<sup>18</sup>

This is relatively higher than the average differential of Northwestel compared to Bell Canada, which was 19% in 2001 (see Table 6), possibly due to the greater use of “high end” Internet and data services by businesses relative to consumers as well as greater consumption of long distance services.

High speed local access via DSL (enabled by the successful Connect Yukon program) and via cable modem service (in Whitehorse) is generally available. All of the interviewees have high speed DSL or cable modem service. In some cases, dial up Internet was still being used, particularly in some locations outside of Whitehorse.<sup>19</sup>

A number of interviewees identified, though, that service reliability is low and that the throughput is not always sufficient to meet certain high-end applications.

For some organisations with a broad presence across the Yukon, it was identified that DSL is not available in some communities.

Overall themes from the interviews:

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<sup>17</sup> Based on information obtained in eight interviews.

<sup>18</sup> Per research conducted by LYA published in “Telecom Services for Small and Medium Enterprises in Canada – 2003”.

<sup>19</sup> Identified by 4 of 11 interviewees.



### 5.1.1 Lack of connectivity between communities to enable high-end applications

Although there is high-speed connectivity covering most of the Yukon, the interviewees identified that the bandwidth available within the Yukon and between communities can be insufficient to support high-end applications (or not available at a reasonable price).<sup>20</sup>

One application was identified by First Nations groups, which would like to establish a private network amongst the various First Nations communities for voice and data services. Other applications centred around accessing central databases and systems in Whitehorse from outlying communities. Connectivity was identified as an issue, for example, for transmission of medical imaging and other medical files.

### 5.1.2 There are limited connections and capacity in/out of Yukon to rest of Canada

With the continued increase in the use of Internet and development of applications, the interviewees identified that there will be an increasing need for bandwidth connectivity in and out of the Yukon.<sup>21</sup>

The interviewees see that as the use of Internet increases and as the applications become more advanced, that the capacity for connection from the Yukon to the Internet will become the limiting factor in development.

### 5.1.3 Mobile network is inadequate

The interviewees identified the issue of coverage and limited capabilities of the present mobile network as well as the lack of roaming for business travellers.<sup>22</sup>

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<sup>20</sup> Identified by 6 of 11 interviewees.

<sup>21</sup> Identified by 4 of 11 interviewees.

<sup>22</sup> Identified by 4 of 11 interviewees.



## *5.2 Telecom and Internet service providers*

LYA interviewed Northwestel plus five telecom operators that are active elsewhere in Canada. In addition, four Yukon-based ISP's were interviewed (three as part of a meeting in Whitehorse, one by phone) as well as one ISP based in Yellowknife that had previously operated in Whitehorse.

The objective of the interviews was to understand if telecom competitors see opportunities for entry in the Yukon, as well as to gain insight into levers for development of alternatives based on experience elsewhere in Canada.

The telecom operators see a limited opportunity in terms of development at an infrastructure level in the Yukon. Also, given the shakeout that has occurred in the competitive telecom industry, smaller players in particular are likely to remain focused on the larger core markets.

None of the telecom operators interviewed identified plans to enter the Yukon telecom market.

On the other hand, competition in Internet services is vibrant. In addition to Northwestel, there are four other ISPs. YKNet (the original Internet provider in the Yukon) serves most communities in the Yukon. Polarcom is in Whitehorse as well as areas such as Dawson and Marsh Lake. Microage operates in Whitehorse as does WHTV. WHTV is the local cable television company, which provides Internet service using cable modems.

The following are other considerations that were identified in terms of telecom industry development:



- Most telecom competitor networks run east-west in Canada. Hence the opportunity to enter the Yukon is not one of incremental investment, but involves a major build to the North.
- The largest entity building a new business in Western Canada is Bell West, a subsidiary of Bell Canada. However, Bell Canada also owns Northwestel, and would not enter to compete with itself.
- Telus – the ILEC in Alberta and BC – is developing competitive networks outside of its ILEC territory, but is focused on Ontario and Quebec.
- Lack of access to subsidies limits the ability of competitors to enter the market. A subsidy could make the difference in terms of entry based on a marginal business case. However, subsidies are available only to the ILEC.

Bypass of the Northwestel network is technically possible using satellite facilities. This approach has been used for Internet service by at least one ISP based in Yellowknife (but not currently operating in the Yukon). In this case, the ISP serving a remote community sends its traffic via satellite and then connects to the Internet elsewhere (e.g. Edmonton, Ottawa, etc.).

Pricing for Internet termination is much higher in the Yukon than elsewhere in Canada. Rates in major markets are only about 20% of the rates provided by Northwestel. The combination of the satellite connections and the more favourable rates for termination in major markets can be attractive depending on the specific situation.

However, the use of satellite as a bypass mechanism has a number of potential drawbacks:



- Depending on the technology employed, the satellite connections may be less reliable than terrestrial.
- The cost equation would be impacted by the capacity requirements, in turn driven by the mix of applications (consumer versus business).
- Bi-directional capability can be provided either via a satellite uplink, or via terrestrial backhaul. In the latter case, therefore, expensive terrestrial circuits are required in any case.
- For telephony, satellite connections generally have audible delay. Also, the interconnection regime presently would imply payment of contribution to Northwestel, eroding potential benefits of a “bypass” architecture.

Thus while attractive in some cases, and a source of innovation, satellite-based bypass does not provide an all encompassing solution to promote development of alternative networks, high speed connectivity and telecom service competition.

#### 5.2.1 Comments on Alberta SuperNet as a development model

The Alberta SuperNet project is designed to bring high speed connectivity to communities throughout Alberta. The project itself was awarded by the Alberta Government to Bell West (a division of Bell Canada).

SuperNet is somewhat unique in that it is virtually the only major project of its kind in Canada that was not awarded to the ILEC (in this case Telus). Bell Canada won the project to build a competing network to Telus.



For the largest communities, Bell will be funding the build and will count on the Alberta Government as an anchor tenant in those areas. For 395 small communities, Bell acts as a general contractor to build to those communities on behalf of the Alberta Government. In these cases, the ultimate facilities are to be made available to other service providers.

Even though the project was not awarded to Telus, Telus remains a key participant in it. Via subsequent proceedings and tariff applications, Bell Canada is though now able to “build out” a number of the more rural areas in Alberta making use of a Dark Fibre tariff for wholesale capacity from Telus.<sup>23</sup>

Thus while the jury is still out on the ultimate success of the Alberta SuperNet, the model provides some useful input in terms of how industry development could be stimulated in the Yukon. The Yukon could build on the Alberta experience, by considering:

- An entry opportunity was created for a competitor in Alberta (Bell Canada, via Bell West, to compete with Telus), however Telus retained a portion of the project ultimately by providing Dark Fibre.
- Creating a project for all of Alberta was an ambitious undertaking, and one which was amenable to a large entity (in this case Bell Canada). On the other hand, had competitors been able to anticipate availability of viable wholesale tariffs (such as the Dark Fibre tariff) to complement the network build, then other competitors may also have been interested.

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<sup>23</sup> The term Dark Fibre refers to strands of fibre made available within a cable, wherein the purchaser of the Dark Fibre can then activate and make use of the fibre. This is often done on the basis of “indefeasible rights of use” (IRUs), which can be thought of as buying a condominium fibre within the larger cable. Telus’ Dark Fibre tariff is provided pursuant to Telecom Decision CRTC 2003-4. The tariff is available to Axia SuperNet Ltd., which is Bell Canada’s sub-contractor for constructing portions of the network. Axia SuperNet also operates the network on behalf of the Alberta Government.





- Recognising that the Yukon market is too small and dispersed to expect all out competition, promote development of applications and competition at the services level. This would leverage the combination of facilities that are in place and investments that have been made already (e.g. via Connect Yukon), as well as put in place new capabilities to support future development.
- A more competitively neutral approach to that used in Alberta could be considered for development of new facilities. This could be via a modified structure within which the ILEC as well as competitors have access to new facilities/capacity, and/or in which a third party builds facilities as a utility to be provided on a non-discriminatory basis to all parties. The participation of the ILEC (coupled with the recognition of the need for viable wholesale tariffs) would assist in avoiding potential issues of stranded investment.

The SuperNet project provides for a government role in supporting facilities development in areas that would be uneconomic. It also provides for the government to act as an anchor tenant in more attractive areas to support development of facilities by a competitive provider.



### 5.3 *Observations*

The business users interviewed have seen significant progress in telecom development in the Yukon. This is reflected in comments on the broad availability of DSL access as well as on the observation that retail pricing in general seems to have declined.

On the other hand, the business users have seen no evidence of telecom competition, other than at the level of retail Internet services.

Although prices have been declining, they remain typically higher than those seen elsewhere in Canada.

Retail pricing, however, does not necessarily tell the “story” in terms of service and competitive development. Prices are often higher in the North than elsewhere in Canada, so the fact that they are higher for telecom services is not surprising.

The high retail prices should make entry attractive for competition. However, even though long distance competition was opened in 2000, there has been no entry. This is due to structural issues with the pricing, which effects competition in the long distance market.

For long distance competition to occur in the Yukon, the competitor must interconnect with Northwestel in Whitehorse to get equal access trunks (to support customer pre-selection so the customer can use the competitor services). In addition to the direct cost of interconnection, there is also a carrier access tariff (CAT) charge of 7 cents per minute per end.



The CAT charge contains an overlay “contribution” charged approved by the CRTC to provide Northwestel with added revenue to compensate for lost market share.

However, with the CAT at 7 cents per minute per end, this could equate (depending on the traffic flow) to up to 14 cents per minute.<sup>24</sup>

With the retail price ranging from 10 cents per minute (residential off-peak) to 19 cents (business peak), the CAT by itself can represent 70% to 140% of the retail rate paid by the end customer. This is before the competitor pays for internal operating costs, sales, marketing, etc.

Even if the competitor were to link all of its traffic out of the Yukon (e.g. by satellite) and send it to the public network elsewhere (e.g. in Edmonton or Vancouver), the competitor would still be liable for payment of the CAT to Northwestel. This effectively negates opportunities for entry.

A similar situation exists for high-speed Internet service.

Northwestel has wholesale tariffs for accessing customers using its DSL capabilities. This costs the ISP \$17 per month per customer. However, the service must also be linked from the Northwestel switching centre to the ISP. The cost of this link is \$2,200 per month regardless of the number of customers carried. The ISP must then link the customers to the Internet, purchasing wholesale services from Northwestel.

The total cost per customer of the arrangement thus varies with the number of customers. Given the small size of the market, a typical ISP is likely to have only in the range of a few hundred customers. If the ISP only has 100 customers, the cost of the wholesale



services represents about two thirds of the retail rate, even before paying for Internet connectivity.<sup>25</sup>

While the exact nature of the ISP cost of services will depend on the number of customers, the capacity needed, mix of residential and business, etc., the ISPs interviewed identified that the sum of the wholesale services can exceed the retail price.

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<sup>24</sup> The CAT rate includes switching and aggregation services, contribution and equal access. It applies to all originating and terminating minutes in Northwestel territory (peak and off-peak). Decision CRTC 2000-746, paragraph 54.

<sup>25</sup> Assuming retail rate of \$60 per month. Wholesale costs would be \$17 for DSL access plus \$22 for the connection from the CO plus the cost of Internet connectivity.



## **6. Key findings and recommendations**

### **6.1 Assessment**

Overall basic service penetration in Yukon does not lag the rest of Canada. Penetration of telephone lines, as well as consumer take-up of Internet is higher than elsewhere.

However, based on the research conducted, there appear to be issues related to the capacity and availability of bandwidth both within the Yukon as well as to link the Yukon to the rest of Canada.

In addition, despite significant roll-out of DSL access across the Yukon, some communities are not yet served with high speed access.

Despite the roll-out of DSL, and even though consumer use of Internet is quite high, Yukon businesses tend to lag the rest of Canada in terms of Internet usage. Given the importance of Internet particularly for the small and medium business market, this is one area that should be a focus of development.

Competition was introduced for long distance services in the Yukon in 2000. However, there does not appear to have been any entry by competitors to date, and none of the competitors interviewed for this Report identified any plans for entry.

Competitor entry for long distance is hampered by the shake-out that has taken place in the industry. This has resulted in generally fewer competitors than before, and has also increased the remaining competitors' focus on major markets.



That said, however, long distance entry is also impeded by the structure of the regulatory regime put in place. Competitors need to interconnect with Northwestel in Whitehorse and pay a carrier access tariff (CAT) charge per minute of traffic. This creates a high cost structure wherein the costs seen by a competitor to provide service in the Yukon can be higher than the prevailing retail rates (depending on the type of traffic).

A similar situation exists for the Internet service providers (ISPs). Although there are a number of independent ISPs competing in the market, the cost structure is highly dependent on the relationship between the prevailing retail rates and the wholesale charges from Northwestel. As with the long distance case, the wholesale rate structure can be higher than retail.

In the research conducted, mobile services were also identified as an issue by the business customers. This was both in terms of the lack of coverage presently available as well as the lack of roaming agreements which in some cases prevents incoming business traveller ability from using the mobile network that is in place.

## ***6.2 Areas for development***

Given the small size and remoteness of the Yukon market, competitive entry cannot be anticipated to occur as it would in the major markets. However, development of infrastructure would be beneficial to the development of telecom services in the Yukon, particularly given the lag of business use of Internet, and the need for greater mobile capabilities. Also, service level competition and development of advanced applications using the infrastructure that is in place can occur.

Based on these considerations, and on the research findings, the following three areas should be the focus of future initiatives in telecom development:



### 6.2.1 Facilities and competition in the Yukon

In order to foster and enable the development of advanced services in remote communities, the facilities across the Yukon will require continued development and upgrade.

Given the remoteness and small size of many Yukon communities, the significant investments that have already been made, and the extensive regulatory structure in place to support Northwestel, the upgrade of facilities across the Yukon is an area that at some level is already being addressed.

To some extent issues identified concerning capacity across the Yukon may be more a question of the price/cost relationship than a lack of availability per se.

Small communities can benefit from development of local capabilities, for example, in the context of Internet service providers. This has been the case in a number of smaller centres in the Northwest Territory and Nunavut. While this type of business can be developed by bypassing the terrestrial network (i.e. by using satellite), the broader development of these areas also relies on a viable wholesale/retail cost structure and interconnection regime.

The question of facilities across the Yukon and competitive development should be considered as one focusing on the regulatory framework and the support provided to Northwestel via various mechanisms that promote the upgrade and expansion of facilities and capabilities.



The regulatory regime needs to ensure that opportunities are present for the emergence of local initiatives where viable. Regulatory action should be taken to “correct” wholesale pricing where it exceeds retail rates – particularly for long distance and Internet services.

Since Northwestel’s wholesale and most retail rates are regulated and Northwestel’s rate of return is also regulated, a viable and reasonable wholesale/retail structure should be achievable.

### 6.2.2 High capacity link to the south

This development would focus on increased capacity in and out of the Yukon (i.e. from Whitehorse south) and would have a variety of benefits. There are at least three socioeconomic benefits of a high speed link to the south. It would (1) enable local businesses for e-commerce to promote export of Yukon-based goods and services. It would (2) help build up local IT firms and expertise (as part of the Yukon’s Information Technology Sector Strategy)<sup>26</sup>, and also (3) support advanced applications in health, education and government services.

As an enabler for development, this link would remove a major cost element of doing business for telecom and Internet companies in the Yukon. It would facilitate connection to the national backbone networks – voice, data, mobile – providing service providers (including Northwestel) with the capability of offering new services and platforms, which in turn could have a stimulating effect and be an important lever for development of the local economy.

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<sup>26</sup> Advanced telecom infrastructure is a key enabler for the IT sector, supporting development of local skills, R&D, education, etc.





The link should be considered as part of the basic infrastructure serving the Yukon, in a similar way that modern airports and highways promote development of local business and tourism.

### 6.2.3 Mobile network coverage and capabilities

Mobile networks can be built locally at a reasonable cost (as witnessed for example by New North Networks in Inuvik). However, to fully enable mobile services, advanced platforms are required (e.g. for billing, SMS, Internet access, signalling, etc.).

Mobile service is highly dependent on the availability of backhaul facilities for traffic as well as for connection to these systems and platforms. So even if additional mobile coverage can be added relatively easily by deploying cell sites in and around target market areas, the presence of backhaul capacity to facilitate use of a mobile carrier's "back office" is a key enabler to development.

The development of added mobile capability converges with the question of the link to the south. The link could provide access for mobile carriers (including Northwestel) to leverage existing investment in advanced infrastructure elsewhere (e.g. in 2.5G networks of GPRS and 1XRTT technology), and thus promote incremental coverage investments to meet the market need in the Yukon.

## **6.3 *Regulatory issues and enablers***

The regulatory framework is a key component of any initiative in the Yukon. The present system of subsidies embodied in the Northwestel service improvement program (SIP) was subject of a recent review<sup>27</sup>, however the CRTC has not yet issued its Decision.

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<sup>27</sup> "Northwestel Inc. – Initial Annual Review of Supplemental Funding", Public Notice CRTC 2002-1



The CRTC review is considering overall issues in terms of Northwestel's overlay funding, progress in terms of investment in services and network, the level of the CAT and contribution charges, etc. Depending on the outcome of these, the following issues may or may not remain important and could be subject to action going forward:

- There is an imbalance in the charges associated with long distance entry, wherein the wholesale cost of interconnection (i.e. the CAT) can be greater than the prevailing retail rates for service. Since both the retail and wholesale rates are tariffed based on Northwestel's costs as well as on a regulated rate of return, this situation does not appear to be warranted. Since the CAT is intended to recover costs associated with enabling competitive entry, having a CAT set at a level that impedes entry is counter-productive.
- A similar cost structure issue exists in the wholesale data services and Internet connections provided to ISPs. Depending on the customer mix and traffic requirements, the wholesale charges can exceed the prevailing retail price. While Northwestel is not the only retail provider in the market, it is a significant player and has control over the cost structure of its ISP competitors. This effects both the local access for ISPs as well as the use of facilities across the Yukon and the Internet gateway service.
- In addition to the wholesale pricing of services, there are issues with the structure of interconnection with Northwestel. In the case of long distance, even if competitors were able to link traffic out and bypass Northwestel, the regime would require payment of the CAT. In the case of Internet service, the lack of co-location with Northwestel means that ISPs have an architecture that sees customers linked to them via Northwestel, then linked back to Northwestel for connection to the Internet. This structure increases the costs for the ISPs relative to those that would be seen by Northwestel as an ISP.



Addressing these areas is important in the context of the three areas of development identified. A viable wholesale regime is key to support for ISPs and telecom competitors, so that where service innovation can emerge, it does.

#### **6.4 *Possible model for development***

A key development supporting both the development of Internet services and applications as well as mobile networks in the Yukon would be the build of a new high speed link to the south.

Northwestel currently operates a microwave facility for this connection, which is ultimately linked to the national fibre backbone in Fort Nelson. In terms of building a fibre facility to close this gap, Northwestel's view is that the economic case is not viable.

However, it is plausible that as the needs and applications grow, the present Northwestel facility will be strained to the point where it will need to be upgraded or supplemented anyway. In that case, this provides a trigger for an alternative approach to building something new, which could involve the participation of third parties.

Recognising that the private sector is unlikely to develop the project on its own, and consistent with its policy to support industry development, the Yukon Government could take a role in development of this new facility. It could set up a project wherein a third party would develop the link to the south. This third party could be a consortium of interests including Northwestel, the YTG and others.

The mandate of the third party would be to find funding and partnering arrangements and opportunities (e.g. from future highway, electricity, pipeline, etc. projects) to support development of the link. The mandate would also include competitively neutral access to



the capacity of the link once it is built, supporting development of new services and applications particularly focused on Internet and mobile services.



## **7. Appendices (confidential)**



**7.1**      *Appendix 1 – End customer interview results*





**7.2**     *Appendix 2 – Internet Service Providers*





### **7.3**     *Appendix 3 – Telecom service providers*