STRATEGIC PLAN

2002 - 2010

iCORE

ALBERTA INFORMATICS
CIRCLE OF RESEARCH EXCELLENCE

POSITIONING ALBERTA GLOBALLY

Executive Summary

Alberta can achieve its core ICT goals of 140,000 jobs, $1.5 billion in R&D, and $30 billion in GDP by 2010.[1] A six-point strategy to achieve these goals can be outlined:

1) Identify high growth segments of ICT in which Alberta can be a global leader
2) Recruit and fund the best researchers and graduate students in these segments
3) Support the development of competitive ICT business in these segments
4) Invest in globally competitive research infrastructure
5) Implement Alberta ICT models in health, education and government services
6) Implement a marketing-branding plan for Alberta's ICT achievements

A critical mass of experts with the right training, experience and expertise in high growth areas is an essential element of any successful ICT strategy. Insufficient expertise can cripple the ICT initiative, and insufficient numbers of high quality people can throttle the high growth rates required. iCORE's primary role is focused on (1) and (2): to identify high growth segments in which Alberta industry and universities can realistically develop global leadership, and to fund exceptional leaders and students in these segments.

iCORE has already achieved initial success in two such segments. Three major research teams in wireless received $18.4 million and two teams in nanotechnology received $6.8 million. The latter was a key element in the recent $60 million federal commitment to an NRC National Nanotechnology Research Institute at the University of Alberta. Although nanotechnology may be a longer-term emerging segment, wireless is a rapidly growing segment in the near-term in which Alberta can achieve global leadership.

iCORE also has a role in (3) to (6) of the six point strategy. For example, iCORE's wireless investment directly attracts and supports the wireless industry; iCORE has provided leadership in the $20 million multimedia advanced computational infrastructure (MACI) initiative; the secretariat models effective use of ICT; and increased visibility has been achieved through marketing iCORE Chair awards. Nevertheless, iCORE's strength and focus are on (1) and (2), with the primary responsibility for achieving success in (3) through (6) lying with other provincial initiatives.

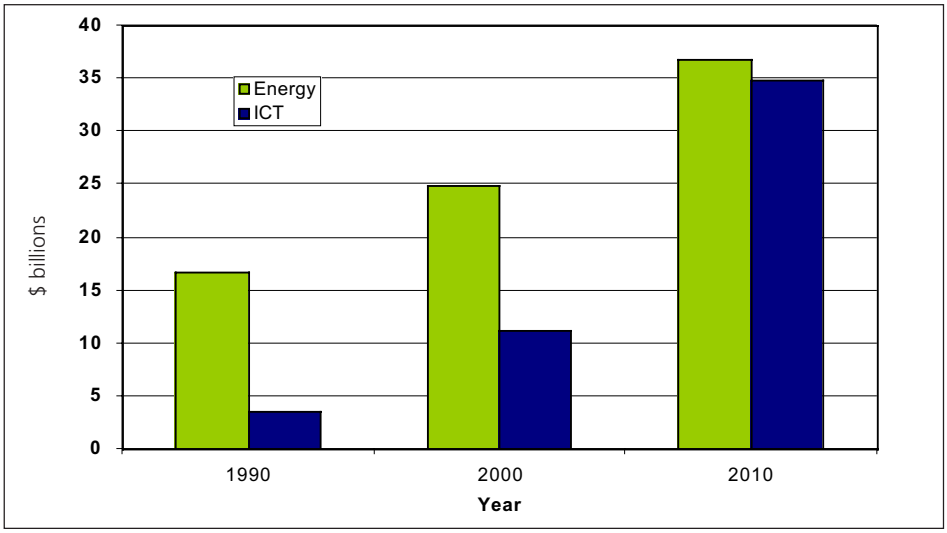
Investment in ICT research directly and indirectly supports thousands of ICT companies within Alberta. In addition, the application of ICT technology boosts the productivity of other sectors of the economy: health care, education, business, and government. Investment in ICT can have a major impact on our economy as illustrated in Figure 1. In Canada, the information technology (IT) sector will be the same size as the total resource sector by 2010 with ICT projected to grow from 8 percent to 13 percent of gross economic activity.[2]

iCORE's strategic plan is predicated on developing a critical mass of ICT excellence at Alberta universities. Further, this plan is aimed at building early links between high quality researchers and industry. The development of "clusters" within target segments of ICT requires both an innovative vibrant business community, as well as, world-class university research.

[1] Alberta Science and Research Authority, *ICT: A Strategy for Alberta*. Edmonton: ASRA, 1998.

[2] TD Bank Financial Group, "The Shape of Things to Come," *TD Economics*, 30 May 2001 (www.td.com/economics)

Figure 1. Projected Alberta Economic Activity: ICT and energy[1]



Top caliber researchers attract other top caliber faculty, research staff, graduate students, as well as, business and investment. New top caliber research faculty will also tend to increase the productivity of the excellent faculty already here, and make it more attractive for the current best, and most mobile, faculty to stay.

Achieving critical mass in ICT research will require a moderate increase in investment over the 2002 through 2010 period. The proposed plan requests 2002-03, 2002-04, and 2004-05 funding from Innovation and Science at $10 million, $12 million and $14 million, respectively. Without this level of funding increase the iCORE board and secretariat believe it will not be possible to meet Alberta's ICT goals. Total research funding, including money from ASRA, NSERC (federal), industry and the universities, will be $19 million, $23 million and $29 million, respectively. By 2010 the annual $15 million per year investment from Innovation and Science will directly fund $48 million per year in research.

Twenty-four outstanding research teams led by iCORE Chairs and Fellows will be funded by 2007. Four to five major awards per year would be sustained, while the same number will expire each year. These awards thus must cover both renewals and first time recipients. ***It is the considered opinion of iCORE's board and secretariat that this represents the "minimum" needed to achieve the province's current ICT goals.***

The direct and indirect influence of these iCORE-funded researchers will substantially expand and support the current ICT research excellence within the universities. ***The direct economic impact of ASRA's investment in iCORE is estimated to be greater than $400 million per year by 2010.***[2]

Adding these 24 high quality teams in high growth areas to the existing faculty and researchers at Alberta's universities ***can make Alberta an internationally recognized center of excellence in ICT research by the second decade of the millennium.***

1 This chart is based on information from: Government of Alberta, *2000: Highlights of the Alberta Economy;* TD Bank Financial Group, "The Shape of Things to Come," *TD Economics*, 30 May 2001; and assumes a 12 percent annual growth rate for ICT.

2 See Table 1 on page 7.

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1 A Winning ICT Strategy for Alberta

It is important that Alberta has a strong ICT sector in order to ensure a diversified economy and to support the advancement of all sectors of the economy in an information society.[1] Alberta's ICT goals can be realized by identifying needs, understanding what is possible, and following a considered strategy.

1.1 New and emerging technology will lead GDP growth

- ICT will continue to be the highest growth sector over the next 10 years.[2]
- Biotechnology and nanotechnology are emerging, high-growth areas expected to reach substantial capacity in 10 to 20 years.
- ICT has great potential for high economic impact: wealth creation for entrepreneurs, investors, knowledge workers, thousands of small companies with new demand for business and manufacturing services.

In Canada the information technology (IT) sector will be the same size as the total resource sector by 2010. The IT sector will grow from 8 percent of GDP today to 13 percent in 2010, while the resource sector decreases from 15 percent to 13 percent. The oil and gas part of the energy sector will be an exception, expected to grow from 3 percent today to 3.3 percent in 2010.[2]

- The energy resource sector, which includes oil, gas, foresty and agriculture, is at, or near, capacity. R&D investment will not generate significant new growth. (Investment may be needed to maintain the sector.)
- The ICT sector is volatile. Focus is required on medium- and long-term average growth rates, not on short-term blips.
- Alberta needs an ICT focus for near-term GDP growth balanced with a longer-term view towards emerging sectors such as nanotechnology.

R&D in science and engineering is becoming a measure of the health of a nation's economy.[3]

- The application of ICT technology boosts the productivity of other sectors of the economy: health care, education, business, and government.
- ICT is an environmentally friendly industry. It achieves economic growth while preserving the natural environment and community life.

1 "Can Technology Transform Lives?" *Technoilogy in Government*, September 2001

2 TD Bank Financial Group, "The Shape of Things to Come," *TD Economics*, 30 May 2001 (www.td.com/economics)

3 National Science Foundation, *Science and Engineering Indicators - 2000*, Washington, DC: National Science Foundation, 2000.

1.2 Alberta's ICT goals are achievable

- A GDP of $30 billion in the ICT sector can be achieved by meeting the growth rates shown in Table 1 below.

Table 1. How $30 billion GDP can be achieved by 2010

PERIOD	(YEARS)	GROWTH RATE	AT PERIOD START ($ billions)	AT PERIOD END
1998-2000	3	12%	$8	$11
2001-2002	2	0%	$11	$11
2003-2005	3	10%	$11	$15
2006-2010	5	15%	$15	$30

- The growth estimates in this table are conservative, since overall annual ICT growth rate in the 1990s exceeded 20 percent, with selected segments within ICT growing at rates of 50 to 70 percent per year.

- Targeting high-growth areas, such as *wireless internet oil and gas distribution applications*, achieves the goal even with a two-year zero-growth recession. (By some estimates wireless is still growing at a 15 percent rate within Nortel despite the collapse of the optical telecommunication markets.[1])

What does success in the ICT sector look like? There is no single magic formula for developing a vibrant ICT sector. However, an understanding of factors at work in other success stories helps shape a winning strategy for Alberta.

(1) Visible commitment
The city of Ottawa shifted from a government-dominated economy to a successful technology hub over 20 years. This was primarily due to government investment in high-profile research institutes that generated ideas, attracted researchers, attracted big ICT businesses to locate near the expertise, and created intellectual entrepreneurs who created and grew many spin-off companies.

(2) High-quality low-cost workforce
Ireland's national strategy to attract US investment and companies, and to function as an entry point to European markest, has been successful due to a combination of low taxes and the availability of a well-educated yet low cost workforce.

(3) Collaboration and focus on selected ICT areas
Finland's transition from a debt-ridden industrial economy to the most productive information-based economy in the world resulted from government, university and industry cooperation with a shared focus on selected areas of ICT. This was achieved despite disadvantages of geography, high tax rates and size.

(4) Low taxes, research universities and business attraction
Based on its low personal and corporate tax structures, significant funding of research universities, and a targeted plan to attract major ICT businesses, Texas has developed a strong ICT sector clustered in Austin and Dallas.

[1] Peter Garrett, wireless industry consultant and former VP, Wireless Access Development, Nortel

1.3 A six-point strategy for investment in ICT

A series of meetings of the iCORE board, universities, industry, and the Ministry of Innovation and Science's ICT advisory committees has produced a strategic plan for ICT in Alberta. Six key elements of this provincial plan are outlined below.

1) Identify and target high-growth segments of ICT in which Alberta industry and Alberta universities can be global leaders:

- Define these segments in collaboration with government, industry and university researchers.
- Target segments of ICT in which Alberta industry and universities can become global leaders; and then build a critical mass of R&D and corporate excellence in these areas.

2) Recruit and fund the best researchers and graduate students in these segments:

> As the knowledge-based economy requires new skills and competencies, the quality of human resources is the major factor behind invention and diffusion of technology.[1]

- Exceptional breakthroughs and major economic advance emerges from the research of outstanding people who tend to create environments that are intolerant of mediocrity.
- Top caliber researchers attract other top caliber faculty, research staff, graduate students, as well as business and investment.
- A critical mass of high quality people in the targeted segments is crucial to self-sustaining success.
- Excellent graduate students are crucial to pursuing research.
- Graduate students commercially exploit innovation as entrepreneurs, designers, and managers in start-up, mid-sized and large companies.

> Major high tech companies open facilities in locations where there are a lot of underemployed smart people.[2]

3) Support the development of competitive ICT business in these segments:

- Implement a competitive personal, business and investment tax structure.
- Streamline automated government services for business, with anytime access.

[1] OECD, *A New Economy? The Changing Role of Innovation and Information Technology in Growth*. Paris: OECD, 2000.

[2] James Gosling, VP, Sun Microsystems

- Support commercialization of intellectual property, mentoring of entrepreneurs, and incubation of start-up companies.

- Target iCORE Chairs in concert with universities to attract industry.

4) Invest in globally competitive research infrastructure:

- Advanced infrastructure is essential to attract and retain the best researchers and students, and to maximize the innovation and output of researchers.

- Target high impact, enabling infrastructure such as advanced research laboratories with open-access policies, large-scale shared scientific computing power and noncommercial high-end research networks.

5) Implement Alberta ICT models for health, education and government services:

- Government can create demand for ICT goods and services by becoming a model user for health, education and other government services, for example, SuperNet, We//net.

- This local demand can support the expansion of local fledgling ICT industry.

- The application of ICT knowledge-based solutions for education, health and government can boost productivity and social health.

6) Implement a communications and marketing plan for Alberta's ICT achievements:

- Promote global visibility of Alberta ICT research excellence.

- Create Alberta brands in the target ICT segments though a marketing program that is coordinated across all of Innovation and Science initiatives.

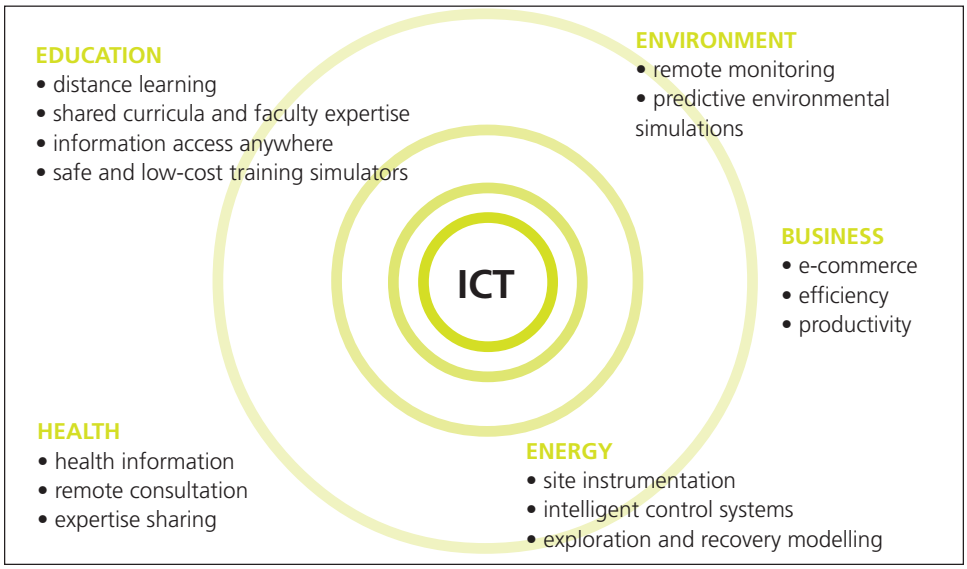


Figure 2.
The impact of R&D in the information and communications technolology (ICT) sector is pervasive

2 Investment Priorities with Limited Funds

With a provincial strategic plan in ICT such as the above, what are the highest priority elements? It is not possible to achieve economic success without high quality people with expertise and deep experience in the targeted segments of ICT, so the initial focus must be on people.

> The impact of a top researcher can be more than 10,000 times the impact of an average one.[1]

2.1 Top researchers are the top priority

- ICT is innovation driven. An industry built on average ideas or people will not achieve our goals.
- All major ICT success stories involve superior research by top people.
- The first priority, therefore, is to recruit and fund exceptional researchers in carefully considered target areas.
- Creating a competitive ICT business environment can be equally important to the extent that it supports the recruiting of outstanding people to the targeted research areas.

> The private rate of return to investment in R&D is quite high, often 10 to 20 percent. Owing to technology spillovers, social rates of return to R&D investment are substantially higher.[2]

2.2 Threshold for success

- A limited number of research areas must be targeted in which Alberta can reasonably expect to achieve internationally competitive university-based ICT research.
- To develop strong economic results and vibrant associated industry, these must be high-growth ICT segments – such as wireless Internet access.
- In order to grow a dynamic critical mass of exceptional ICT researchers in these high-growth segments, a certain threshold of activity must be achieved to create and sustain a culture of research excellence.

1 According to Nathan Mhyrvold, former Chief Scientist at Microsoft, this has been measured among programmers in particular. In Seth Goodin, *Unleashing the Idea Virus*. New York: Do You Zoom, 2000.

2 OECD, *A New Economy? The Changing Role of Innovation and Information Technology in Growth*. Paris: OECD, 2000.

2.3 Definition of threshold targets

- Four to five targeted segments that are strengths in the ICT sector of Alberta are to be identified.

- Achieving critical mass in these targeted segment of ICT will require four to six outstanding research teams in each segment.

- The consensus reached through a series of workshops and meetings with the iCORE board, universities, industry and ICT committees is that achieving international recognition for Alberta research in ICT will require funding for high-quality research leaders that add at least 10 percent to the current university ICT faculty. This is equivalent to 24 teams.

- Thus iCORE's goal is to recruit 24 exceptional research team leaders, with four to six teams working in each of the target areas.

2.4 iCORE's role

- iCORE's role is to attract and fund top researchers in these areas, with a concerted aim to achieving a critical mass.

- iCORE also attracts and funds a substantial number of the best graduate students in ICT to support an excellent research system.

- iCORE is increasing support for linkage between the best university research groups and private companies in order to exploit the results of research locally and stimulate a vibrant industry.

[1] National Science Foundation, *Science and Technology Indicators 1996*. Washington, DC: NSF, 1996.

3 2002-10 Strategic Plan

The essence of this strategic plan is to continue to strengthen the programs launched by iCORE in January 2000, and to develop new programs that both leverage iCORE funds and develop links between iCORE's lead researchers and industry.

3.1 Strengthen current programs

ACHIEVE GREATER FOCUS

- iCORE will identify and target high-growth segments of ICT in which Alberta industry and Alberta universities can be global leaders.

- Target areas are being identified through a collaborative process with the universities, industry and government. A panel of internationally recognized experts in ICT – called the ICT Research Advisory Committee (IRAC) – has been formed to advise iCORE's board and secretariat on target areas, and on objectives, strategies and programs. (This committee will also be available to provide advice to other provincial bodies on ICT objectives, strategies and programs.)

- Greater focus in target high-growth areas in which Alberta can achieve a globally competitive position will increase the likelihood of meeting provincial economic goals, for example, funding ICT research relevant to Alberta's oil and gas industry.

- Revised target focus areas under consideration are:

    1) broadband networks including wireless, Internet protocols, cryptography, intelligent algorithms and agents;
    2) high performance computing and databases including computational science, modeling and simulation, parallel and distributed systems, data mining and fusion, wide area database networks, visualization;
    3) new models of computation including nanotechnology, molecular and DNA computing, quantum computing; and
    4) ICT research that has application in Alberta's energy and life sciences sectors, such as agriculture, forestry, clean coal, oil sands, geoinformatics, health sciences, bioinformatics.

    Note that only fundamental and applied research that advances ICT will be funded by iCORE, not research in the application areas themselves.

IMPROVE CURRENT PROGRAMS

- iCORE will continue, and strengthen, the current Chair and Professorship Establishment (CPE) Grants program aimed at recruiting and funding the highest quality research leaders in the target ICT areas.

- iCORE will continue, and strengthen, its Graduate Student Fellowship (GSF) program aimed at recruiting the best graduate students in Canada.

- iCORE will continue to ensure timely high-quality arms-length review of candidates and proposals. Within the ICT sector quick decisions are often crucial, thus proposals will be accepted at any time with monthly reviews.

- Collaborative programs and cooperative projects with the Alberta Ingenuity Fund, Alberta Heritage Foundation for Medical Research, TRLabs and Alberta Research Council will continue to be explored.

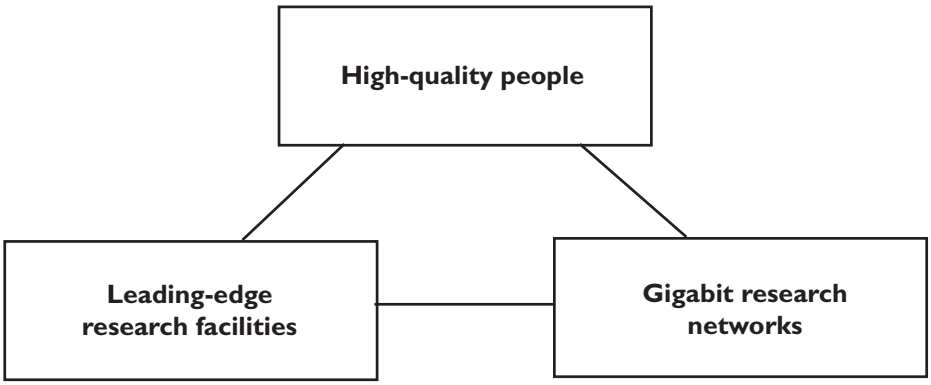
- iCORE will continue to work with the Alberta government and its ministries to address the retention of the best Alberta university faculty, and the funding of indirect costs of research associated with iCORE's programs.

PARTICIPATE IN BUILDING ALBERTA'S RESEARCH GRID (INFRASTRUCTURE)

Two of the top four priorities identified as necessary cornerstones of long-term strategic ICT initiatives are (1) scalable information infrastructure including advanced networks and (2) high-end computing.[1]

- A significant factor in our ability to attract and retain the best people is the availability of leading-edge research infrastructure (see Figure 3 below). Research infrastructure is of crucial importance to high quality researchers and includes advanced computation and laboratory facilities, as well as very high-speed research networks that connect to other leading-edge researchers and research organizations throughout the world.

Figure 3.
High-quality people and Alberta's research infrastructure



- iCORE will continue to support building an internationally competitive research infrastructure within Alberta. This includes active (non-financial) support for initiatives such as Alberta's research network, NeteraNet; province-wide collaborative computing infrastructure projects such as WestGrid and MACI; advanced nanotechnology instruments of the open-access MicroFab lab; research facilities such as the 3G wireless virtual lab, bioinformatics labs, the Banff Centre and initiatives such as SuperNet.

[1] PITAC, *Information Technology Research: Investing in Our Future*. Washington, DC: President's Information Technology Advisory Committee, 1999.

3.2 Developing long-term industry collaboration

- iCORE joins with industry and NSERC to support research in ICT at Alberta universities through the creation of its Industrial Chair Establishment (ICE) Grants program. Chairs, Fellows and their associated research teams will be appointed in collaboration with Alberta universities, NSERC and industry partners.

- The ICE program provides industry access to the highest caliber, internationally competitive research with costs shared by federal and provincial partners. Alberta industry will gain access to premium infrastructure and top researchers. Intellectual property constraints are not imposed by the conditions of this program.

- The ICE program also helps universities build on existing strengths to achieve the critical mass required for major research endeavors in industry-related areas of ICT.

- ICE will leverage iCORE's funds through matching money from industry and the federal government, the latter through a partnership with NSERC.

3.3 Developing early university spinouts to industry

- iCORE encourages early exploitation of the results of university-based research that has the potential for high economic impact.

- Building relationships, where appropriate, between Alberta industry and iCORE Chairs and Fellows is a key objective. Once iCORE Chairs have opened a relationship with technology companies, further relationships can be nurtured that may lead to companies locating business units or product development groups in Alberta.

- Industry-related programs that support iCORE's central goal – to recruit the best Chairs and Fellows, and to build critical mass in the form of academic and industry research clusters – are the priority.

- iCORE aims to leverage its funds with money from industry and federal sources. This may involve finding ways to work with shorter-term financial commitments from industry.

- One avenue being explored is a "collaborative research and development" (CRD) program modeled on NSERC's current CRD Program. iCORE's goal in such a program is to target only the highest quality research that has exceptional potential for economic benefits within Alberta.

4 Financial Plan

> Prosperity requires technological innovation.[1]

The financial plan is aimed at supporting the achievement of Alberta's economic goals for the ICT sector by 2010 – that is, 140,000 jobs, $1.5 billion in R&D spending and $30 billion in GDP.[2]

Alberta's goals in ICT cannot be met unless critical mass is achieved in four to five high growth areas within ICT, and these must complement and support dynamic industry clusters in these areas.

To help achieve these economic goals, iCORE aims to support four to five major Chair or Fellow awards per year with sustained support for 24 such positions and associated teams by 2007 and continuing through 2010. This highly focused 10 percent addition to current academic staff positions – individuals of exceptional calibre – is required to achieve critical mass and significantly increase the quantity and quality of ICT research.

4.1 Proposed scenario: Achieving critical mass

- The proposed 10-year financial plan for the Proposed Scenario is summarized in Table 2.
- This plan meets the Alberta targets for ICT primarily through support for Chairs and Fellows and their associated research teams, a continued commitment to recruiting a greater number of the best graduate students, and the introduction of an Industrial Chair Establishment (ICE) grant program, or equivalent, with industry.
- The number of iCORE Chairs and Fellows funded is illustrated in Figure 4. By 2007, the required threshold of 24 major Chair and Fellow awards is reached, and sustained through 2010.
- The number of graduate students supported grows from the current level of 86 students per year to reach 160 by 2005, with steady increase as the clusters grow, reaching 195 by 2010. The cumulative number of graduate students produced will be 266 in 2005, and 1,101 by 2010.
- The total number of faculty, staff and students supported grows from the current level of 95, to 265 in 2005, reaching 315 by 2010.
- The total funding for Collaborative Research and Development (CRD) awards grows from $400 thousand in the first year to reach approximately $1.2 million in its third year and remains steady in subsequent years.
- Funding from federal government and other sources is assumed to be $3 to $4 million per year in the latter half of this plan.

[1] Bill Clinton and Al Gore, *Science in the National Interest*. Washington, DC, 1994.

[2] Alberta Science and Research Authority, *ICT: A Strategy for Alberta*. Edmonton: ASRA, 1998.

- The funding requested from ASRA in the next three fiscal years, 2002-03 through 2004-05, is $10 million, $12 million and $14 million, respectively.

- Figure 4 shows the number of Chairs and Fellows, university faculty and research staff supported each year through 2010.

- Figure 5 shows the proportion of research funding coming from ASRA, in relation to funding from the universities, federal, industry and other sources.

- The projected "direct" economic impact of iCORE is projected in Figure 6. This projection shows how the investment of ASRA funds directly leverages other contracts signed for major awards. This projection assumes that (i) an increasing percentage of graduate students produced stay in Alberta, (ii) each student staying in Alberta returns $300 thousand per year into the economy after graduation, and (iii) 10 percent of the industrialprojects result in spinouts that return five times their funding each year, starting after three years.

Table 2.
Proposed financial scenario: Achieving critical mass

$$ dollars in thousands	**00-01**	**01-02**	**02-03**	**03-04**	**04-05**	**05-06**	**06-07**	**07-08**	**08-09**	**09-10**
CPE Awards	5,800	5,900	4,900	4,900	6,200	6,340	8,680	10,220	10,360	10,500
ICE Awards	0	0	600	1,200	1,830	2,460	3,090	3,150	3,210	3,240
RG Awards	1,800	1,800	1,800	1,800	1,800	300	300	300	300	300
CRD Awards	0	0	400	800	1,220	1,240	1,260	1,280	1,300	1,320
Subtotal Major Awards	**7,600**	**7,700**	**7,700**	**8,700**	**11,050**	**10,340**	**13,330**	**14,950**	**15,170**	**15,360**
GSF Awards	1,300	1,300	1,430	1,573	1,730	1,903	1,998	2,098	2,203	2,314
ISPR Awards	150	300	300	300	300	700	300	300	300	300
Total All Awards	**9,050**	**9,300**	**9,430**	**10,573**	**13,080**	**12,943**	**15,628**	**17,348**	**17,673**	**17,974**
Secretariat	970	980	1,000	1,100	1,100	1,100	1,210	1,270	1,270	1,270
Overhead %	10%	10%	10%	9%	8%	8%	7%	7%	7%	7%
Total Expenditures	**10,020**	**10,280**	**10,430**	**11,673**	**14,180**	**14,043**	**16,838**	**18,618**	**18,943**	**19,244**
Total Research Contracts	**17,800**	**18,000**	**19,260**	**22,546**	**28,611**	**28,187**	**41,007**	**46,527**	**47,257**	**47,907**
Number of										
CPE Awards	2	6	8	10	12	14	14	14	14	14
Major Awards	5	9	13	17	21	22	24	24	24	24
Faculty	10	18	26	34	42	44	48	48	48	48
PDFs & Staff	15	27	39	51	63	66	72	72	72	72
GSF Students	70	86	110	135	160	171	183	187	191	195
Cum # Graduates	0	0	70	156	266	401	561	731	914	1,101
Total Researchers	**95**	**131**	**175**	**220**	**265**	**281**	**303**	**307**	**311**	**315**
$M Fed\ & Industry	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**4**	**4**	**4**
ASRA Contribution	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
ASRA and Others	**0**	**0**	**0**	**2**	**4**	**4**	**4**	**5**	**5**	**5**
Economic Impact	**8**	**8**	**9**	**17**	**28**	**42**	**74**	**113**	**186**	**421**

Figure 4. Number of high-quality people supported, based on four to five major awards per year and 24 teams sustained

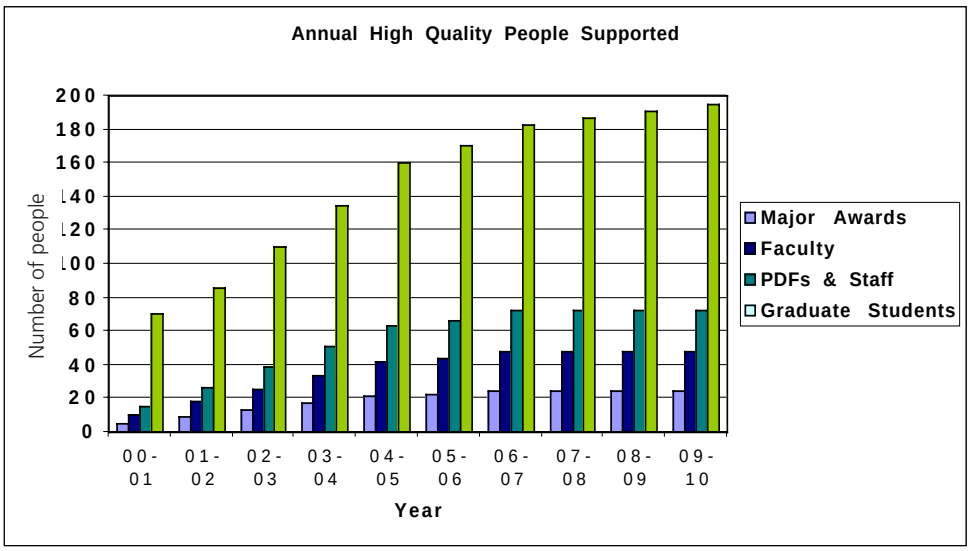


Figure 5. Research funding showing ASRA contribution and the university, federal and industry funds it attracts

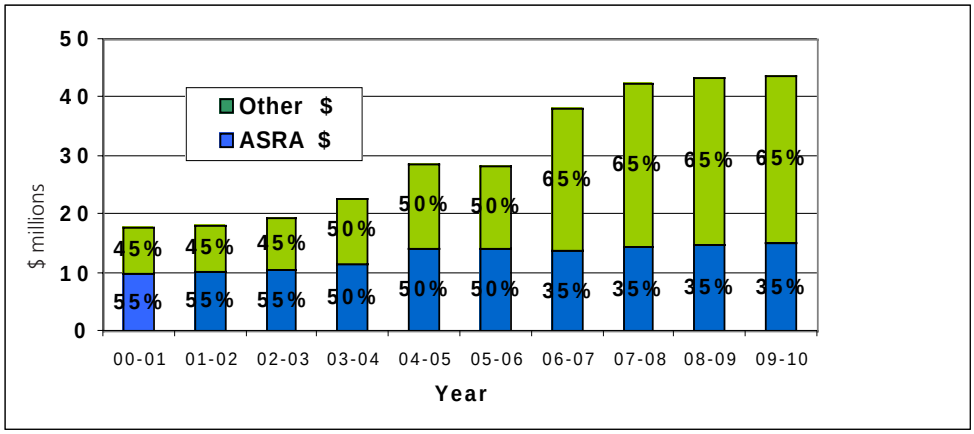
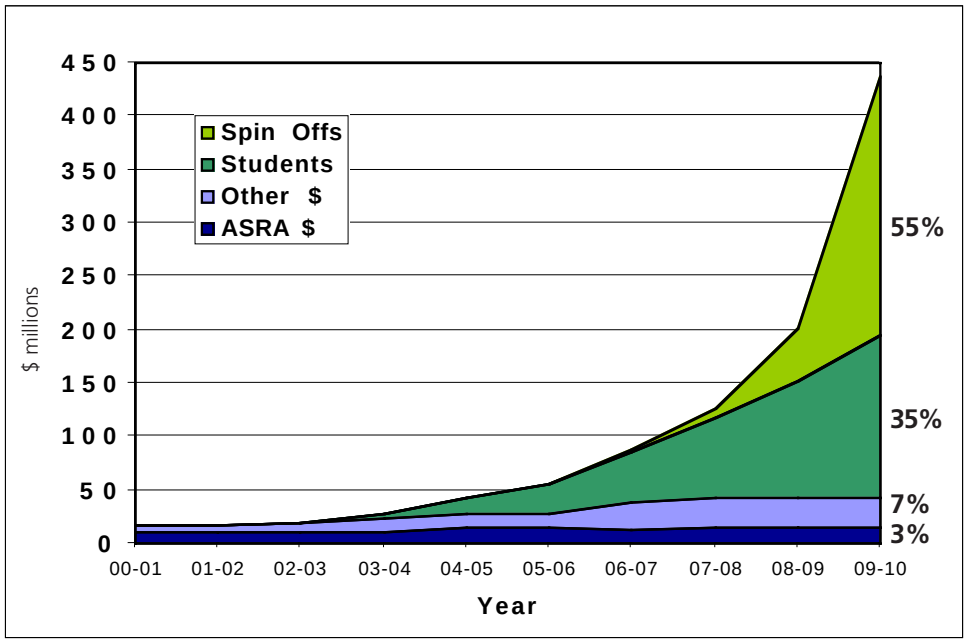


Figure 6. Projected direct economic impact of iCORE funding



4.2 Alternate scenario: Flat funding

A scenario that assumes no increases in funding from ASRA is presented in Table 3 below. Revenue from other sources is assumed to be identical to the Proposed Scenario. A comparison of the projected economic impact for the two scenarios is shown in Figure 7.

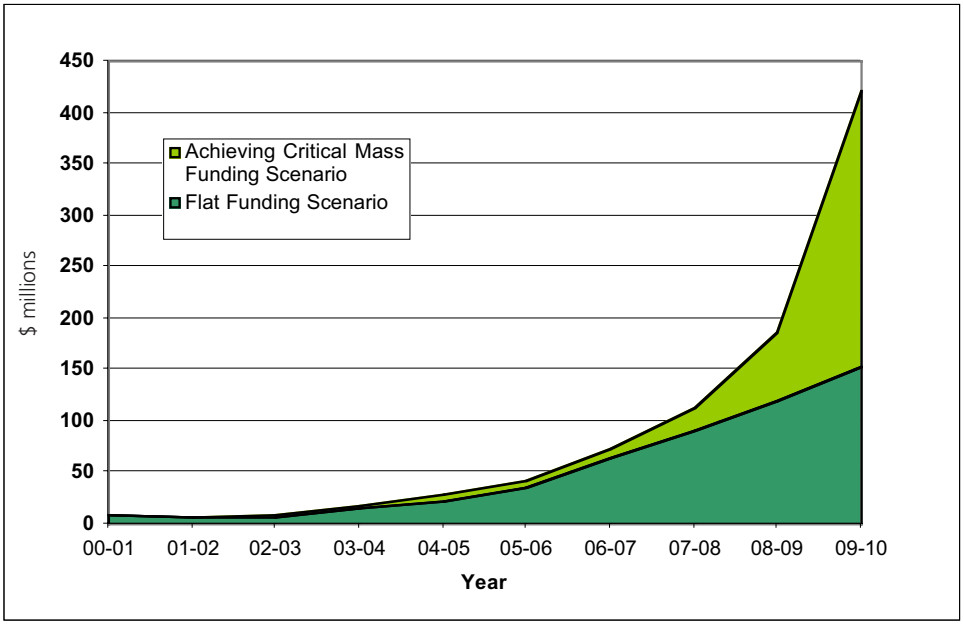
- An average of three Chair and Fellow awards (new and renewed) are made each year from 2002 to 2010. These include the Chair and Professionship Establishment (CPE) Grants as well as the newly introduced Industrial Chair Establishment (ICE) Grants. The CPE awards make up two-thirds of the new awards while approximately one new ICE award is budgeted per year.

- The number of major awards reaches steady state at about 15 awards granted per year in 2003-04. The number of GSF awards is the same in both scenarios, although fewer total graduate students are supported because of fewer major awards.

Table 3.
Alternate financial scenario: Flat funding

$$ dollars in thousands	**00-01**	**01-02**	**02-03**	**03-04**	**04-05**	**05-06**	**06-07**	**07-08**	**08-09**	**09-10**
CPE Awards	5,800	5,200	4,900	4,900	4,800	5,605	7,945	8,785	8,925	8,995
ICE Awards	0	0	300	600	915	1,230	1,545	1,575	1,605	1,620
RG Awards	1,800	1,800	1,800	1,800	1,800	300	300	300	300	300
CRD Awards	0	0	0	0	0	0	0	0	0	0
Subtotal Major Awards	**7,600**	**7,000**	**7,000**	**7,300**	**7,515**	**7,135**	**9,790**	**10,660**	**10,830**	**10,915**
GSF Awards	1,300	1,300	1,430	1,573	1,730	1,903	1,998	2,098	2,203	2,314
ISPR Awards	150	300	150	150	150	300	150	150	300	150
Total All Awards	**9,050**	**8,600**	**8,580**	**9,023**	**9,395**	**9,338**	**11,938**	**12,908**	**13,333**	**13,379**
Secretariat	970	980	980	1,017	1,017	1,017	1,119	1,175	1,175	1,175
Overhead %	10%	10%	10%	10%	10%	10%	9%	8%	8%	8%
Total Expenditures	**10,020**	**9,580**	**9,560**	**10,040**	**10,413**	**10,356**	**13,058**	**14,084**	**14,508**	**14,554**
Total Research Contracts	**17,800**	**16,600**	**17,160**	**18,346**	**19,406**	**19,307**	**31,122**	**35,092**	**35,672**	**36,077**
Number of										
CPE Awards	2	6	8	10	11	12	12	12	12	12
Major Awards	5	9	12	15	17	16	17	17	17	17
Faculty	10	18	24	30	34	32	34	34	34	34
PDFs & Staff	15	27	36	45	51	48	51	51	51	51
GSF Students	70	86	103	121	135	137	145	149	153	157
Cum # Graduates	0	0	70	156	259	380	514	651	796	945
Total Researchers	**95**	**131**	**163**	**196**	**220**	**217**	**230**	**234**	**238**	**242**
$M Fed & Industry	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**4**	**5**	**5**
ASRA Contribution	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
ASRA and Others	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
Economic Impact	**8**	**7**	**8**	**15**	**23**	**36**	**64**	**90**	**119**	**153**

Figure 7. Comparison of projected economic impact on Alberta economy between preferred (achieving critical mass) and alternate (flat funding) scenarios



4.3 Conclusion

iCORE believes that Alberta's ICT goals can be achieved if there is a coordinated commitment to focus on high-growth segments of ICT, and sufficient resources are applied to reach a critical mass of research excellence within these segments. Further, a competitive business climate with strong links between industry development and university research in these segments is crucial.

Adding these 24 high-quality teams in high-growth areas to the existing faculty and researchers at Alberta's universities can raise the level of ICT research in Alberta to a threshold that will achieve the economic impact envisioned for Alberta.

iCORE's strategic plan is designed to build research excellence, attract ICT industry, produce a significant cadre of ICT-trained intellectual entrepreneurs, and enable Alberta to become an internationally recognized center in ICT research by the second decade of the millennium.

5 Accountability

iCORE's strategic plan is part of the overall ICT strategy for the province of Alberta. iCORE has set some aggressive, but necessarily high goals to reach a critical mass of ICT research in the province.

The key measure of success of the iCORE strategy is the attraction, retention and support of exceptional researchers. This is also a primary focus of the Alberta ICT strategy.

Business growth and economic success should follow and thrive in these conditions. iCORE currently tracks the number of researchers and graduate students that are directly funded by iCORE and also tracks the ongoing impact on the primary ICT departments at Alberta universities. iCORE also contributes by identifying key research areas, developing industry linkages, attracting industry and research institutes, supporting creation and development of spin-off companies, and supporting and participating in global marketing of Alberta's ICT attractiveness.

Further measures, such as the retention of graduate students in Alberta and the number of university ICT spin-offs, will be important as we make further progress on our strategy. Economic measures, such as employment and ICT-related GDP growth should follow our targets and will be monitored by iCORE. As we move forward iCORE is committed to playing a key role in the Alberta ICT strategy and being directly accountable for its programs and impacts.

Specific performance measures and associated targets that assume the proposed scenario of achieving critical mass are below.

Table 4.
Performance measures

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Major Awards (new/renew) per year	4	4	4	4	4	4	4	4	4	4
New iCORE graduate students	70	86	110	135	160	175	175	175	175	175
Percent of iCORE graduate students who stay in Alberta	n/a	n/a	30%	30%	30%	35%	40%	45%	50%	55%
Direct leverage of iCORE funds (1)	2:1	2:1	2:1	2:1	3:1	3:1	4:1	4:1	4:1	4:1
Industry funding per year ($ million) (2)	0	0	0.5	0.5	0.5	1	1	1	1.5	1.5
Federal funding per year ($ millions) (2)	0	0	0	0	0	0	3	4	4	4
Licencing/ patents/ spinoffs from iCORE programs	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd
Economic Impact	1:1	1:1	1:1	1:1	1:1	3:1	5:1	8:1	12:1	12:1

Notes
(1) Leverage of iCORE funding with other sources (industry, university, other government) within iCORE contracts
(2) Additional funding from other sources that iCORE attracts for iCORE purposes. These funds may or may not flow directly through iCORE, but iCORE has some control over the funds.