



Edmonton Economic Development Corporation

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Noon**

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Thank you, Brent and Glen.

And, my thanks to the EEDC for inviting me to speak to our community today. Edmonton and the University of Alberta work so closely, hand in glove, on so many important initiatives—take Expo 2017 as an example. We're working together to maximize and leverage investments in infrastructure that will be of great benefit to both the city and the university. Enterprise Square and TEC Edmonton are two other joint initiatives with the City and EEDC. So it's very important that we share ideas and priorities regularly and work together to advocate for and advance our common goals.

But before I begin, I want to begin with a little ritual that you all know well. I would like each of you to take your trusty digital device—Blackberry, iPhone, Palm, whatever you use—from your belt or pocket, or out of your bag and purse, and hold it in your hand.

First, you do have it turned off, don't you?

Now, take a second moment to take a good look at it. In your hand, you hold the symbol of innovation.

We call them "smart" phones. These smart phones have transformed our lives—our social lives, our business lives, our family lives, even our emotional and physical well being.

Even in underdeveloped parts of the world—such as Africa and India where they never had a land-line—mobile phones are everywhere.

Today's smart phones inform us, remember for us, remind us, entertain us.... On days when it seems like my thumbs are in motion the whole day—I sometimes stop, look at this little device, and recall the old Monty Python line: "Is this a piece of your brain?"

Okay, you can put it away now—still turned off, is it? Good.

Looking at “Smart”

I wanted to begin today with taking a fresh look at the smart phone—and all it stands for—as the symbol for what I want to talk about today: Smart People; Smart Ideas; Smart Innovations; Smart Partnerships

In my business, smart is our stock in trade—our core business. The University of Alberta is known for having smart students, smart faculty, smart staff, smart infrastructure and smart governance. This is what we must cultivate to be competitive.

Sometimes people say the university thinks it has cornered the market on “smart” in Edmonton, but let me assure you that we don’t think that.

Without the collaboration of a smart city, we know we would be far less formidable as a competitor. Edmonton is a smart city—it has many of the right elements identified by individuals like Richard Florida and Tom Friedman:

- ethnic and cultural diversity;
- a strong mix of smart leaders—many of them our graduates;
- an outward-looking, international perspective;
- a robust, rigorous K-12 education system; and
- a strong commitment to enriching the personal lives of our citizens through the arts, sports, connections to nature, and many other public resources that promote tucking away the smart phone and getting out and activating more than our thumbs.

The smart phone reminds us that we are now in a new economy—the global knowledge economy. It rolled in at the beginning of the last decade like a lamb and is now roaring like a lion.

The quick advance of the smart phone reminds us that the greatest challenge facing us is speed—smart ideas become smart innovations in shorter and shorter incubation times.

We, here in Alberta, are fortunate to have an abundance of natural resources. However, making the most of these also requires rapid innovations whether in meeting emerging environmental standards for the oil sands or adding value to our agricultural products.

This is where the university’s and the city’s priorities are entwined. We both desperately—and I do not use this word lightly for either of us—need to strengthen and diversify our economic base by attracting and retaining smart, 21st century, knowledge-rich talent, businesses, industries, and organizations in our region.

More than education: The U of A in the Edmonton Economy

I know many of you know the University of Alberta well. Many of you are alumni of our institution. We may also have educated your parents and maybe your children.

That's us, right over there on the other side of the river where you see the cranes. Those cranes are symbol of the growing demand for cutting-edge education, research, and career preparation for the next generation.

But just as you took a fresh look at your smart phone, I want you to take a fresh look at the University of Alberta. The U of A is a major economic engine that not only helps build the industries and businesses of the province but is also a major corporate citizen of Edmonton.

When you think about this, it becomes an obvious point, but sometimes it can be easy to lose sight of the facts. Think of this:

- The university employs approximately 14,500 greater Edmonton area citizens.
- It is Edmonton's third largest employer and Alberta's fourth largest.
- The U of A employee payroll is more than \$725 million annually.
- Employee spending power—coupled with that of our more than 37,500 students—is estimated at \$5.2 billion annually.
- \$4.5 billion of that spending occurs in Alberta, mostly in the greater Edmonton area.
- That represents more than 92,000 jobs in Alberta as the multiplier effect ripples through the economy.

This is just the tip of the iceberg of our economic impact on Edmonton.

Probably more widely recognized is the impact in the marketplace by talented, market-ready graduates and ground-breaking research results. Distinguished U of A alumni have founded or led Edmonton powerhouses such as PCL Construction, Stantec, the Katz Group, the Citadel Theatre and Venture Magazine. They have served as our premier, mayor, as members of the provincial legislature and federal parliament.

Importance of a World-Class Research Institution in Edmonton and Alberta

Indeed, our impact goes far beyond Edmonton or Alberta.

We, like many of you, have international aspirations. The University of Alberta aspires to be in the league of top public research universities in the world. Why? Not for peer recognition and personal satisfaction, but because of what we can contribute to the Edmonton, Alberta and Canadian economy. We currently we rank 59th in the Times Higher Ed rankings—one of only four Canadian universities ranked among the top 100 in the world.

We know that by rising in the league of world-class universities, we are attracting and retaining smart people and building research collaborations around the world - converting knowledge into smart innovations to benefit Edmonton and Alberta. However, we must rise even higher in quality to match institutions in the east and the west.

Think about Seoul National University and the corresponding economic prowess of South Korea or Stanford and the entrepreneurship of the Silicon Valley. These world-class universities have a profound influence on the economic and entrepreneurial power of their regions.

How have they done so well? They transform their citizens into the smartest people on the planet through education and discoveries. Let me explain.

Attracting and Nurturing Smart People

In a recent column in the *New York Times*, Thomas Friedman observed that new research shows that between 1980 and 2005, nearly all new jobs created in the U.S were created by companies that were 5 years old or less. I suspect it is true for South Korea as well.

Young, entrepreneurial companies, Friedman says, are started by “smart, creative, inspired risk-takers.” He says there are only two ways to create this type of risk-takers: by improving schools and education and by recruiting talented immigrants—who are by definition risk-takers since they are ready to pull up roots and head to an unknown land to expand their opportunities.

Friedman also points to America’s world-class universities as critical to prosperity in the last century. He says “because of our vibrant and meritocratic university system the best foreign students who wanted the best education also came here, and many of them stayed”. He goes on to say that these High IQ risk takers were able to raise capital for their ideas and commercialize them creating a very powerful self-reinforcing engine. Think of Sergey Brin, the Russian born co-founder of Google, a global giant started in 1998 which Sergey and Larry Page were doing their Ph.D’s at Stanford University.

Alberta’s growth over the last century is a testament to the risk-taking of immigrants, but we are falling way behind. Let me share with you some distressing statistics.

Let’s begin with the front end of the pipeline. Alberta’s 15 year olds consistently score among the very best in the world in math, science, and reading according to OECD data. Kudos for us! But Alberta has one of the highest high school drop-out rates and the lowest post-secondary participation rates in the Canada.

Want the facts? In 2009, Statistics Canada reported only 14% of Albertans between the ages of 20-24 attend university, DOWN a full 2% since 2008. Compare this to B.C.’s participation rate of 23% or Saskatchewan’s 20%.

Meanwhile, beyond Canada, millions and millions of young people in countries like India and China are flocking to university and college in numbers never seen before.

We have a lot of work to do with our partners, both in K-12 education and among the post-secondary community, to win the minds and hearts of the young people we are counting on to be our future leaders.

Let us build their desire, curiosity, and ambition so that they choose post-secondary education. Let us make investments and create incentives that will turn the tide of drop outs. Let us stimulate the “lust” for knowledge, the elixir that will reveal transformative new worlds and paths of self-fulfillment for them. The benefits will first be theirs, and then ours.

Next consider our rate of attracting international students to our universities.

In 2008, Alberta had 14,000 international students in all-level of post-secondary institutions, 6,900 at our universities. BC had almost three times that number although our populations are similar – (50,000 at all levels, 18,500 in its universities). The numbers for Ontario and Quebec were even higher.

International students spend \$6.5 billion in Canada—that’s worth more than our export of coniferous lumber or coal. How can we get smart about competing for these international students—this international resource?

In a smart new initiative, the University of Alberta and Edmonton are exploring how to join marketing resources to recruit international talent to Edmonton together. Alberta and Canada must also improve their global brand to compete for international students who are currently flocking to Australia, the US and the UK for undergraduate and graduate education.

Attracting graduate students is particularly important. Innovations like your smart phone are not created by smart high school graduates. Such innovations take sophisticated knowledge and education. Many of the most promising industries and technologies—like nanotechnology—require graduate degrees—most often PhDs.

Let’s look at graduate student enrollment per thousand population. Canada averages 3.2 per thousand, and Alberta 2.5.

Compare that to the US average of 7.3 per thousand. Now, where do you think the new ideas, businesses, and industries are likely to develop?

Want to really be alarmed? China, in little more than fifteen years, has increased the number of doctoral degrees in engineering and natural science to over 20,000 per year from 2,500. They are now only slightly behind the US which produces 22,500 per year.

Does investment in graduate education and R and D make a difference?

Consider this: In the same period, China’s share of global high-technology exports increased from 7.5 percent to 20 percent today. Now you might say China is a populous nation with whom we can hardly imagine competing.

But consider smaller countries like Israel or Finland. Israel has been leading the world with innovations. Major companies such as Intel, Microsoft, IBM, and Google have major research and development centres in Israel. Israel has more companies listed on the NASDAQ stock exchange than any other country in the world except the US. Why?

Israel has the highest percentage of engineers in the work force and the highest ratio of university degrees. Israel ranks 1st in the world on public expenditure on education and has the highest rate of R&D investment in the world - four times that of Alberta. Imagine that – a wealthy region like ours is investing four times less. It’s like driving on the autobahn of the knowledge economy with our brakes on!

Whether we draw inspiration from China or Israel, we must invest in people, smart people. If we want to increase our market share of new industries and compete effectively with China or

Israel, we need to graduate and hire more people with masters and Ph.Ds. To be considered in their league, we must strive to be on par with them.

Smart Ideas, Smart Innovations and Smart Partnerships

Another emerging rule of the global economic order is a more systematic or smart approach to innovation – to generate smart ideas through smart partnerships.

Despite the well-established links between R and D investments and innovation, companies are doing much less basic research, while some are doing more applied research and product development. Therefore universities have a more critical role to play in “blue skies” basic research.

The potential impact of a single, extraordinary individual pursuing basic research cannot be under-estimated. An excellent example is Dr. Lorne Tyrell, a University of Alberta virologist. While teaching a graduate course in virology, he discovered that the unique way in which the Hepatitis B virus (HBV) replicates in the liver cells of ducks could be used to develop a drug that would block the virus from reproducing in humans.

The drug Lamuvidine, developed by Glaxo Smith Kline in partnership with Dr. Tyrell and his team, is now licensed in more than 120 countries. Think of the impact: chronic HBV infection causes over one million premature deaths annually. The drug has slowed or prevented death for millions of people and also helps to lessen the fatal effects of cirrhosis and liver cancer.

Dr Tyrell’s work is a prime example of basic research leading to disruptive innovation. It is also a prime example of the role of the private sector.

Universities don’t commercialize discoveries—the private sector does. Alberta needs to increase its receptor capacity across many of the emerging industry sectors to successfully commercialize university research. Attracting these industries to Alberta, and encouraging these partnerships is the key to transferring discoveries into wealth and societal benefits.

We also need to be leaders in world-class “solution-driven” research. Not just in the way we fund research, but in the way we—in universities, industry, business, and government—think about our relationship to one another.

The Council for Industry and Higher Education in the UK recently surveyed over 3000 companies in the US and UK, asking about what factors made the biggest difference in innovation. Thirty percent to 53 percent said that informal contacts, internships, recruitment, conferences, publications, joint research, problem solving and consulting had the greatest impact.

In contrast, only four percent to 17 percent of the companies cited licensing of patents as major contributors to innovation.

At the University of Alberta, Jacob Masliyah, Murray Gray and their teams are in the former category of innovators. They have built extensive collaborative agreements with Alberta’s oil and gas sector involving joint research, internships, recruitment, problem-solving and consulting.

Their research over several decades has resulted in significant improvements in the extraction of oil and in the reduction of environmental impacts.

There are other fascinating models of innovation that have taken hold in the past decade. Models built on open innovation.

Intel, IBM, Tata, BP, BT are co-locating at universities or embedding researchers in universities to foster co-discovery and innovation.

Other forms of collaboratories which involve university, government and industry partnerships are emerging—the National Institute of Nanotechnology located on the University of Alberta campus is an example. Alberta's investments in nanotechnology are beginning to pay off.

Dr. Robert Burrell's invention of Acticoat, an antimicrobial nanocrystalline wound dressing, is being used in clinical practice in over 40 countries around the world. The product is manufactured locally by NUCRYST Pharmaceuticals Corp. in Ft. Saskatchewan. It is the world's first commercial therapeutic application of nanotechnology.

Major international partnerships are also redefining the research landscape.

At the U of A, we've formed the Helmholtz Alberta Initiative, with investments of \$50 million over five years, to study the most pressing issues around environmental sustainability in Alberta's oil sands.

The Helmholtz Association is a German national organization with 16 research centres and a base budget of 1.9 billion Euros. With Helmholtz's extensive connection to European industries, we also anticipate that the Helmholtz Alberta Initiative will lead to a host of new, international university-industry partnerships both on campus and off.

This is what I'd call a Smart Partnership.

NINT and the Helmholtz partnership are not just about the U of A—they are about attracting the world to Edmonton. It's about showing global industries, corporations, and universities about the quality of talent, expertise and infrastructure exists here.

It's about making Edmonton a "super-magnet" for talent and emerging industries. It's about building profile to the benefit of all of us.

Conclusion

We share a goal—the U of A and the EEDC—to use all of our smarts to create new opportunities—economic opportunities—to diversify, advance and secure the economic base and quality of life in our community.

There's little doubt that to be players in the rapidly growing knowledge economy, Edmonton and Alberta need smart people, smart ideas, smart innovation and smart partnerships.

We need to be responsive to the speed, fluctuations and global reach of the knowledge economy. We need to produce fast, knowledge-driven innovations and commercialization.

I suggest the following guiding ideas.

- Let us increase participation in higher education, attract and support “smart people” to our research community, building University of Alberta’s reputation as a world-class university.
- Let us invest in world-class blue skies and solution-driven research in all areas, with some preferential investing in areas where Alberta can lead the world with a competitive advantage. Using the language of Jim Collins in Good to Great, Alberta needs some BHAG’s- Big, Hairy Audacious Goals!
- Let us stimulate open innovation and collaboration between businesses, customers, suppliers, universities and the social sector. Attract and partner with global companies and organizations encouraging them to co-locate or embed researchers in universities, fostering a culture of creativity and innovation through the entire community.

Let me quote the motto of one of U of A’s recent distinguished alumni award winners, a Washington DC elementary-school principal who transformed her impoverished inner-city school into what is now one of the top schools in the nation. Her quote: “A school is as good as the community keeps it.”

Think about it. Remember it when you hear people say the university should not be a priority for investment. Our fates go hand in hand. There’s heavy lifting to do to take the U of A, EEDC, and Edmonton’s economy to the next level.

We’re ready. Are you?

Thank you.

