

WINNIPEG
AEROSPACE

GROW HIGHER | SKILLED WORKFORCE

WINNIPEG WINNIPEG

Set your sights to soar in the largest aerospace centre in Western Canada, the third biggest in the country, with a concentration of skilled labour that's twice the national average.

Accelerated growth in this sector is fuelled by competitive operating costs, R&D tax advantages, top-flight expertise and high productivity. **The aerospace industry in Winnipeg is a critical and thriving component of Winnipeg's diversified and stable economy.**



SECTOR COMPOSITION

Winnipeg's aerospace sector is comprised of more than 50 business establishments in aerospace products and parts manufacturing (NAICS 3364) and support activities for air transportation (NAICS 4881). The sector is anchored by five companies that are either headquartered or have a significant presence in Winnipeg, including [Boeing Operations Canada](#); [StandardAero](#); [Bristol Aerospace, a Magellan Aerospace Company](#); [Aveos](#); and [Cormer Aerospace](#). The industry's primary focus is on composites manufacturing, maintenance, repair and overhaul (MRO), and environmental testing.





SECTOR GROWTH

Canada is a global leader in aerospace and Winnipeg is home to Canada's third largest aerospace sector. Winnipeg's aerospace companies produce and sell products and services valued in excess of \$1.6 billion per year.

Winnipeg's aerospace sector is competitive on a global level, producing world-class products for customers on six continents. Over the last 10 years, Winnipeg aerospace companies have shipped more than \$3 billion in product exports, including \$300 million in exports to emerging markets where Winnipeg companies help meet growing global demand for aircraft and aircraft parts.

Winnipeg's aerospace sector is one of the fastest growing in Canada and has experienced robust growth over recent years. Revenues at Winnipeg's aerospace manufacturers grew by 43 per cent between 2004-2009 (latest figures available). Future growth in the sector is expected to continue to be strong, driven by growing global demand for commercial aircraft, growing demand and production of Boeing's new Dreamliner, stable growth in demand for maintenance, repair and overhaul (MRO), and other growth opportunities.

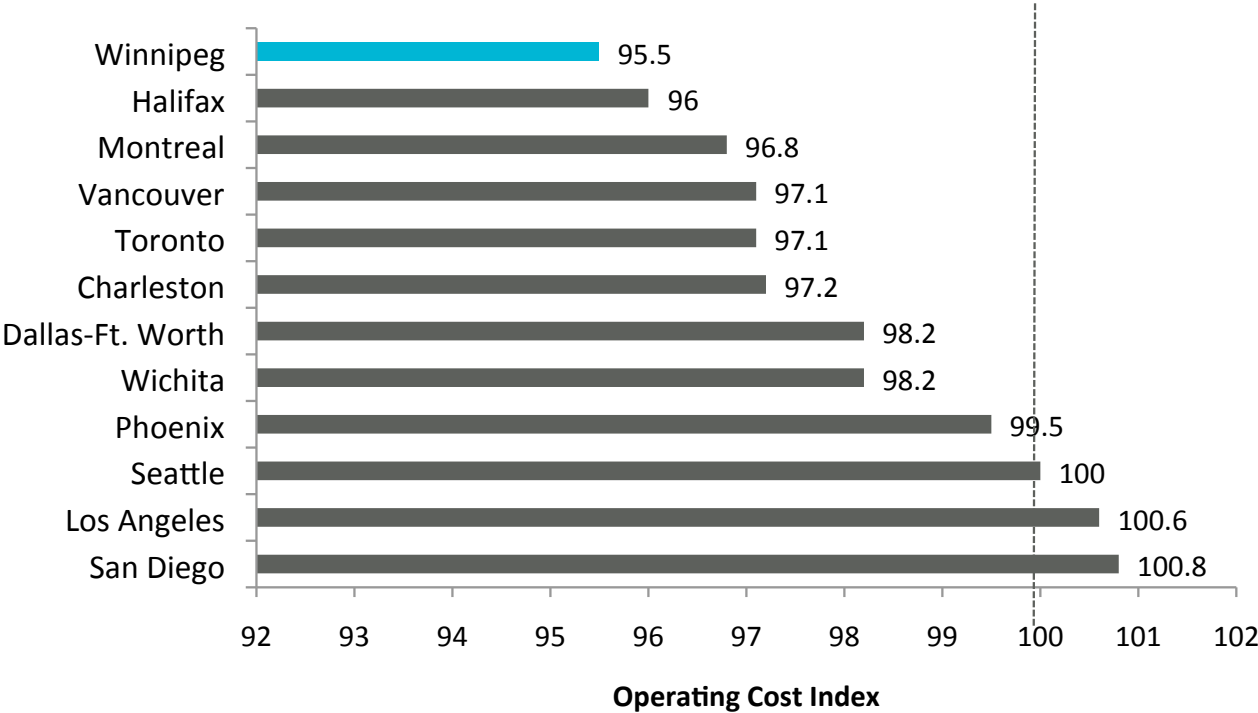
Winnipeg has experienced more than \$800 million in aerospace and aviation-related investment in recent years. As a result of that investment, Winnipeg is becoming a leader in design and manufacturing of composite materials and in environmental testing. Three new aerospace R&D facilities have been announced or launched in 2010-2011.

WINNIPEG'S COMPETITIVE ADVANTAGES

THE LOWEST-COST CITY FOR AEROSPACE MANUFACTURING IN NORTH AMERICA

Winnipeg is the most cost-effective city for aerospace manufacturing in North America. KPMG's 2010 assessment of competitive cities for aerospace manufacturing found that costs of doing business in Winnipeg are lower than all Canadian and US cities that have an existing aerospace manufacturing cluster.

KPMG COMPETITIVE ALTERNATIVES 2010 TOP CITIES FOR AEROSPACE MANUFACTURING - TOTAL COST INDEX



Source: KPMG Competitive Alternatives, 2010

Winnipeg's low factor costs have contributed to Boeing's facilities in Winnipeg being consistently ranked **#1 in lean manufacturing** across all Boeing manufacturing units worldwide. Winnipeg's low cost electricity, reasonable labour rates, weather extremes (for testing) and other advantages have attracted some of the world's leading aerospace firms to Winnipeg.

Compared to other cities, Winnipeg offers one of the highest internal rates of return on investment in an aerospace manufacturing plant.

LABOUR FORCE

Winnipeg offers a hard-working, stable, and highly-skilled labour force supporting the aerospace sector. Low attrition rates help Winnipeg's aerospace firms reduce costs related to workforce turn-over. On average, Winnipeggers work more weeks than workers in any other major city in Canada. Because of Winnipeg's low cost of living, costs of wages are 16 per cent less in Winnipeg than the national average and 24 per cent lower than Montreal.

TABLE 1: WINNIPEG'S AEROSPACE LABOUR FORCE AND WAGE RATES

Rank	City	Aerospace Manufacturing Labour Force	Average Weekly Wages
1	Montreal	29,500	\$1,164
2	Toronto	9,300	\$1,010
3	Winnipeg	4,000	\$886
4	Vancouver	1,800	\$1,127
5	Halifax	900	\$1,045
	Canada	62,300	\$1,049

Source: Labour Force Survey; Average weekly wages for transportation equipment manufacturing

The aerospace workforce in Winnipeg has grown by 46% since 2005, with an additional 1,800 skilled workers in aerospace occupations added to the labour force. While Winnipeg's total employment has grown by 8% in the last five years, the aerospace employment as a percentage of total employment has increased by 35%. These figures underscore the commitment by educational organizations, businesses, and governments to strengthening Winnipeg's aerospace sector and insuring the availability of a highly-skilled labour force.



WINNIPEG'S UNIQUE RESOURCES SUPPORTING THE AEROSPACE SECTOR

Winnipeg presents tremendous competitive advantages to the aerospace industry by offering a unique mix of resources to help the private sector thrive. Whether it is through public private partnerships, tax incentives, financial assistance, or educational programs, Winnipeg is committed to and deeply invested in aerospace's success.

AIRCRAFT TESTING

Two separate engine testing facilities have recently been opened in Manitoba, creating unique opportunities in the province.

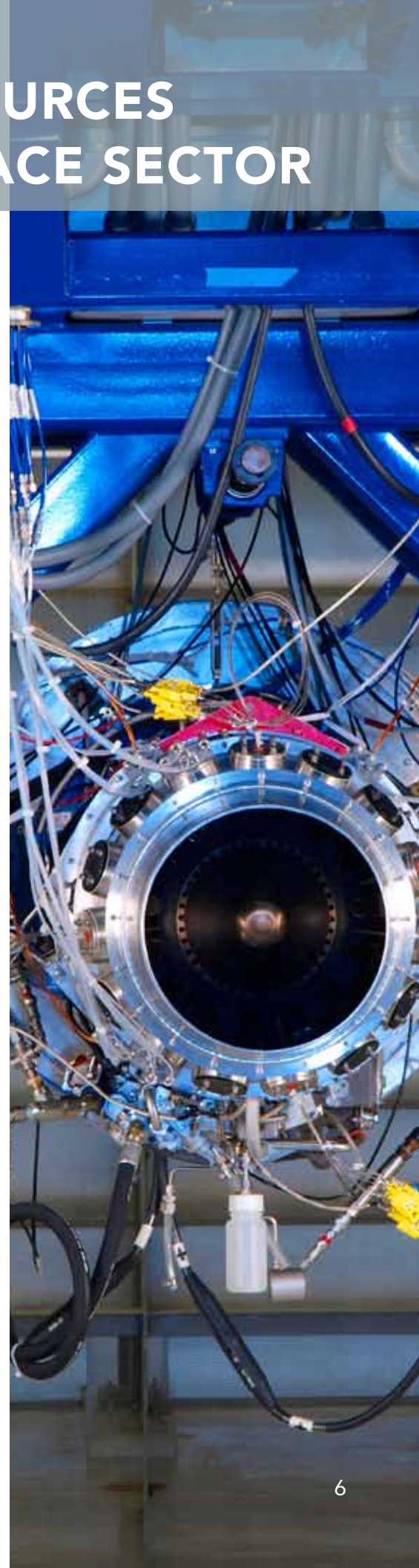
Winnipeg Aircraft Engine Research and Technology Development Centre

In 2011, GE Canada and StandardAero signed an agreement to build a new \$50 million aircraft engine research and technology development centre in Winnipeg. The centre will develop advanced testing methodologies and equipment for GE Aviation's commercial and military aircraft engines. The centre will include test cell capabilities for engines up to 150 inches in diameter and up to 150,000 lbs of thrust as well as capabilities to accommodate high performance military engines. It will be equipped with a large wind generator for crosswind, ingestion and icing certification testing.

Global Aerospace Centre for Icing and Environmental Research

In late 2010, the Global Aerospace Centre for Icing and Environmental Research (GLACIER) opened in Thompson, Manitoba. This \$42 million facility is a highly advanced centre for ice testing to ensure aerospace engine dependability and quality. The centre is a joint venture between Rolls-Royce Canada Limited and Pratt & Whitney Canada, with additional support from the National Research Council Canada (NRC). This leading edge technology and research gives the Canadian aerospace industry the capability to work on the next generation of aircraft and position them at the forefront of future technology developments.

Economic Development Winnipeg Inc.



“The new Aircraft Engine Research and Technology Development Centre in Winnipeg will allow GE Aviation to have access to the latest research and development in engine testing as well as greatly expand our engine testing capabilities.”

- Colleen Athans, Vice President and General Manager, GE Aviation Assembly, Test and Overhaul Operations.

AEROSPACE BIOCOMPOSITES

Biocomposites are being used by Winnipeg manufacturers in a variety of applications by companies in the city’s aerospace and vehicle/ground transportation manufacturing sectors. Winnipeg is home to North America’s two largest bus manufacturers, two major aircraft parts manufacturers, and one large agricultural machinery manufacturer, all of which are active in developing biocomposite-based parts. Using biocomposite parts, which are generally lighter than their fibreglass counterparts, reduces vehicle weight and improves fuel efficiency, enhancing vehicle manufacturers’ competitiveness.

COMPOSITES INNOVATION CENTRE (CIC) located in Winnipeg develops advanced composites technologies for a variety of manufacturing industries. The centre leads several initiatives focused on the development and commercialization of biocomposites using biofibres such as hemp and flax to replace the man-made glass and carbon fibres for advanced composite applications in buses, recreational vehicles, sporting goods and aircraft manufacturing. To date, the CIC has undertaken more than \$12.5 million in research projects.

The CIC is driven by industry requirements. Capabilities developed around core technologies are intended to assist industry in maintaining pace with competitors as well as advancing technologies to provide for a competitive advantage. The depth of competency that the CIC will have within these and other technologies will evolve with the maturity of the CIC, the widening of CIC’s customer base, and the relationships that CIC establishes with technical collaborators.

CANADIAN COMPOSITES MANUFACTURING RESEARCH AND DEVELOPMENT

In June of 2010, the CIC helped launch an aerospace-specific consortium called the Canadian Composites Manufacturing Research and Development (CCMRD). This consortium is comprised of numerous public and private sector partners, including most of the major aerospace firms in Canada such as Boeing and Bristol. A principal advantage of the CCMRD is the fact that it brings together major aerospace companies and small-to medium-sized enterprises with the aim of developing the latest technical and academic knowledge into practical solutions that will enhance Canada's global aerospace competitiveness.

With major initiatives such as the CIC and the CCMRD, Winnipeg has become a true centre of excellence for composites R&D. Because this R&D cluster is in such a concentrated geographic region, it offers an attractive economic opportunity for aerospace companies looking to enhance their composite technologies.



MARKET ACCESS

Winnipeg is home to **CENTREPORT CANADA**, Canada's 20,000 acre inland port. CentrePort offers ample serviced land that is "shovel-ready" for development and is a foreign trade zone (FTZ) offering duty deferral and Goods and Services Tax (GST) exemption to qualifying businesses. Customs duties normally paid on goods imported to Canada can be deferred or recovered and goods can be imported to CentrePort for processing and then re-exported outside of the country on a GST-free basis. These advantages make Winnipeg an ideal inland port for intermediate processing of goods that are shipped to and from Asia, Europe, the US, or Latin America and then re-exported to these markets.

Lowest Electricity Rates in North America

Companies that are large and medium-sized consumers of electricity can experience significant savings by establishing their operations in Winnipeg. Winnipeg offers the lowest published electricity rates in North America. According to the 2010 annual *Comparison of Electricity Prices in Major North American Cities*, published by Hydro Quebec, Winnipeg offers the lowest cost of electricity of major metro areas in the US and Canada. Compared to Winnipeg, the cost of electricity for a mid-sized electricity user (2,500 kW of power demand, 1,170,000 kWh consumption and 65% load factor) is 9 per cent higher in Calgary (AB), 27 per cent higher in Vancouver (BC), 34 per cent higher in Montreal (QC), 80 per cent higher in Edmonton (AB), and more than twice as expensive in Toronto (ON), Halifax (NS), Moncton (NB), and Charlottetown (PE). Compared to cities in the US, the cost of electricity is 6 per cent higher in Houston (TX), 11 per cent higher in Seattle (WA), 68 per cent higher in Detroit (MI), 76 per cent higher in Nashville (TN), and more in other cities. For companies that are very large consumers of electricity, the savings are even greater.





ALIGNED AND CONNECTED

A highly collaborative and supportive network, led by the Manitoba Aerospace Association (www.manitoba-aerospace.mb.ca), helps smaller firms to establish and strengthen relationships with the larger anchor firms in Winnipeg.

Highly Supportive Governments

Government partners offer an array of local, provincial, and national programs that provide financial assistance such as **tax credits, tax incentives, training assistance, R&D assistance, loan guarantees, and wage subsidies**. Canada and Manitoba offer some the most generous R&D tax credits in the world.

Governments are also an active partner by **investing in industry applied research capacity**. Federal and provincial governments have been partners in the establishment of Winnipeg's Composites Innovation Centre (CIC) which has worked alongside Boeing to develop better, lighter, and more cost-effective composites for the aerospace sector.

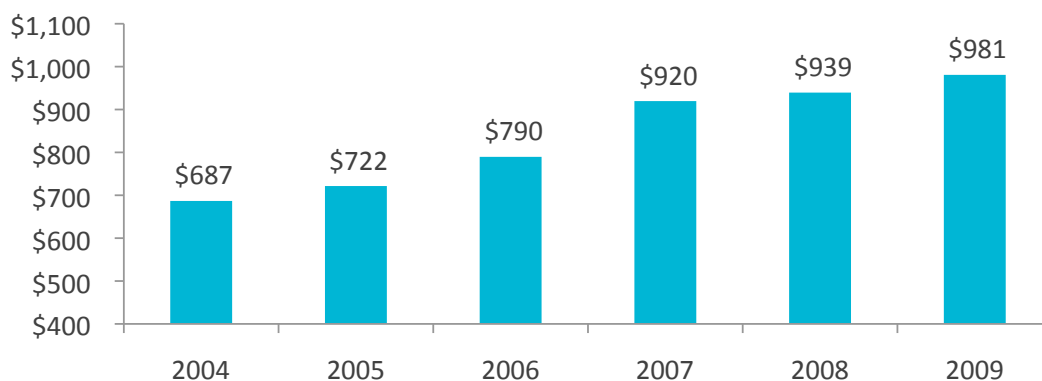
The North American Free Trade Agreement (NAFTA) supports free trade between Canada and the US and the congruence of Canadian and US regulations and laws supports relatively seamless inter-country operations for aerospace firms

WINNIPEG'S AEROSPACE PERFORMANCE

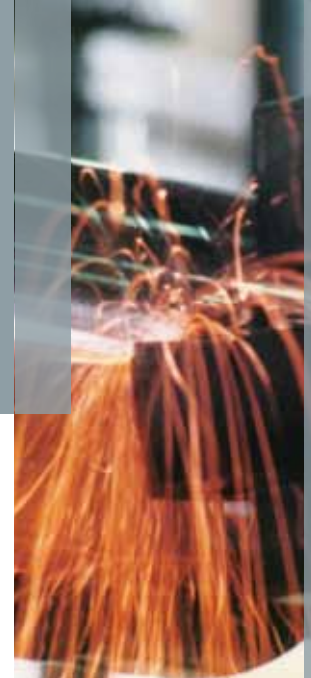
According to the Manitoba Aerospace Association, Winnipeg's aerospace companies produce products and services in excess of \$1.6 billion per year. The sector is comprised of two NAICS industry segments: aerospace products and parts manufacturing (NAICS 3364), which employs approximately 70 per cent of the sector's labour force and support activities for air transportation (NAICS 4881), which represents the remaining 30 per cent.

Annual revenues of aerospace products and parts manufacturers (NAICS 3364) have grown from more than \$600 million in 2004 to nearly **\$1 billion in revenues** in 2009. Over the last decade, Winnipeg aerospace firms have produced and **exported more than \$3 billion in assembled spacecraft and aircraft components and parts**. Nearly \$300 million in exports have been to emerging markets where Winnipeg companies are playing a role in meeting the growing global demand for aircraft. With the recovery of the global economy and Winnipeg's continued investment in the aerospace industry, exports are projected to grow significantly in the coming years.

Combined Revenues of Manitoba's Aerospace Manufacturers (\$ millions)



Source: Annual Survey of Manufacturers, Statistics Canada

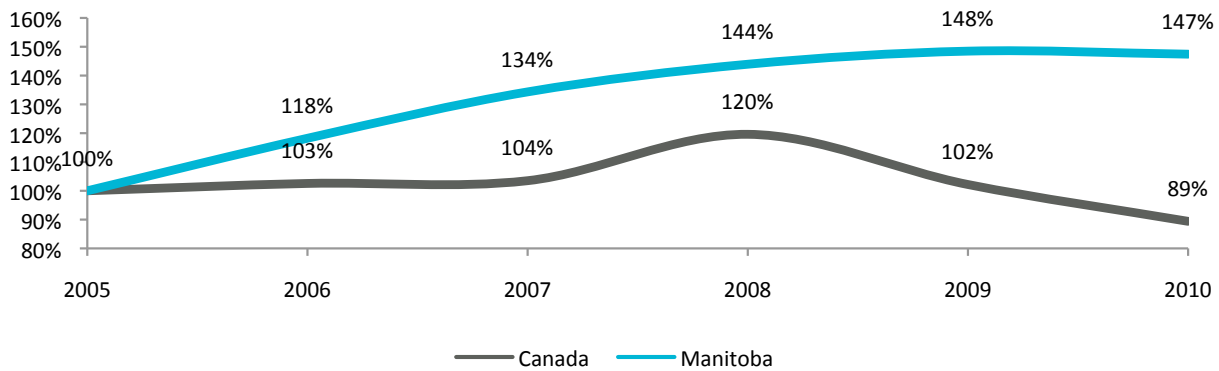


OUTLOOK

The outlook for the sector is positive, driven by global growth in new orders for commercial aircraft. Canada's aerospace sector has benefited from the increase in orders, following one of the steepest declines in new orders in history between 2007-2009. New orders for aircraft products and parts picked up significantly in 2010 and are expected to continue to grow over both the near-term and long-term.

Growth in Manitoba's aerospace sector has outperformed the sector in Canada in recent years. The revenues of aerospace manufacturers in Manitoba increased by 47 per cent between 2005-2010. By comparison, aerospace revenues in the Canadian market were lower in 2010 than they were in 2005 by about 11 per cent.

GROWTH IN SALES OF AEROSPACE PRODUCTS, MANITOBA AND CANADA, 2005-2010



Source: Monthly Survey of Manufacturers, Statistics Canada



“Through Canadian Composites Manufacturing Research and Development (CCMRD), we’re bringing together Canadian companies of all sizes to develop unique capabilities, enhance the skills of Canada’s work force, and increase competitiveness for continued growth in the global aerospace industry and into new markets.”

- Gwen Kopsie, International Industrial Participation Director for Boeing Defense, Space, and Security

RECENT MAJOR INVESTMENTS

The Bristol Aerospace division of Magellan Aerospace plans to build a \$21.3 million, 140,000 sq. ft. (13,000 sq. m.) **advanced composite manufacturing facility in Winnipeg**, in support of the Joint Strike Fighter (JSF) program. The launch customer for the new centre is BAE Systems in the United Kingdom, which awarded Magellan a contract to produce the JSF F-35 Lightning II horizontal tail components. Canada is a partner nation in the funding of the Joint Strike Fighter aircraft, which Lockheed Martin is building.

In late 2010 and early 2011, **two separate jet engine facilities were opened in Manitoba**. These represent a combined investment of \$92 million and are helping put Western Canada at the forefront of jet engine testing. The Winnipeg Aircraft Engine Research and Technology Development Centre will test GE Aviation’s commercial and military aircraft engines. The Global Aerospace Centre for Icing and Environmental Research (GLACIER) will be a highly advanced cold weather testing centre in northern Manitoba.

In March of 2011, a new **Centre for Non-Destructive Testing** at Red River College was announced, receiving \$4.4 million in funding to provide specialized inspection equipment and a network of portable ‘non-destructive’ imaging equipment that can be used by the aerospace industry in their own facilities.

Corner Industries has invested **about \$15 million in production technology** over its 22-year history. In the past couple of years, the company has invested several million dollars in new equipment, including a new five-axis horizontal machining centre, one of only a handful of such machines in operation in Canada.

WHY WINNIPEG FOR AEROSPACE MANUFACTURING?

“Winnipeg has been a very advantageous manufacturing location for Boeing. It’s central to all our customers and the quality of training for the workforce is excellent.”

- Kevin Bartelson , General Manager

WINNIPEG’S ADVANTAGES FOR BOEING:

Winnipeg is a central location with good access to major 787 Dreamliner plants in Seattle and Charleston.

Boeing enjoys a strong supportive relationship with the Government of Canada, the Province of Manitoba, and the City of Winnipeg.

The Winnipeg labour market is highly skilled and hard-working. Boeing has a strong relationship with Winnipeg’s Red River College, which delivers customized education and training for Boeing’s workforce.

The Composites Innovation Centre in Winnipeg has helped Boeing to develop new light-weight and cost-effective composite structures.

Winnipeg’s low-cost electricity and excellent transportation access help keep operating costs low.

These advantages have helped the Winnipeg office achieve Boeing’s #1 rank in implementation of lean manufacturing practices at Boeing.

OPPORTUNITIES FOR SUPPLIERS:

Boeing Canada is actively looking for ways to develop local suppliers to support Boeing’s operations in Winnipeg. Currently, Boeing has 140 production suppliers and approximately 660 non-production suppliers spread across North America. The Winnipeg facility is expecting strong growth over the next 20 years and one half of all business plan dollars for Winnipeg operations are for purchase of materials. Boeing offers a supplier mentorship program in partnership with the Manitoba Aerospace Association with Boeing senior managers acting as supplier mentors. Through the program, mentors work hands-on with suppliers to tighten relationships to better serve Boeing’s needs.

WHY WINNIPEG FOR AEROSPACE MANUFACTURING?

“Bristol Aerospace is celebrating our 50th anniversary of producing Black Brant Sounding Rockets in Winnipeg-with over 1,000 rockets sold worldwide. We have a number of partnerships that have made us successful - industry collaboration, government support at all levels and a high-tech, well-trained workforce. Career journeys begin with high schools and continue with Red River College, University of Manitoba, and University of Winnipeg. They cover professions and trades from engineering to composites to engine technology with specific career paths defined.”

- Don Boitson, General Manager, Bristol Aerospace

PRINCIPAL PRODUCTS AND SERVICES:

Aeroengine components manufacture and R&O

Aerostructures component manufacture and assembly (composite and metal)

Space science programs (manufacture of sounding rockets, small satellites, payloads, space hardware)

Wire Strike Protection Systems (WSPS®) for helicopters

Solid propellant rocket motors

BENEFITS OF BEING IN WINNIPEG:

In partnership with Winnipeg’s **COMPOSITES INNOVATION CENTRE**, Bristol is developing and commercializing the latest applied composites technology for both commercial and military aircrafts.

MANITOBA AEROSPACE ASSOCIATION’s HR Coordinating Council offers training sessions that are directly applicable to Winnipeg aerospace companies and open to everyone in the industry--shared costs and shared benefits.

INDUSTRY COLLABORATION and **STRONG GOVERNMENT** support at all levels.

WHY WINNIPEG FOR AEROSPACE MANUFACTURING?

STANDARD AERO, a Dubai Aerospace Enterprise (DAE) company with nearly \$1.4 billion in annual revenue, specializes in engine maintenance, repair and overhaul, and nose-to-tail services that include airframe, interior refurbishments and paint for business and general aviation, air transport, and military aircraft. The company, part of the DAE Engineering division, forms a global services network of 12 primary facilities in the US, Canada, Europe, Singapore and Australia, with an additional 14 regionally located service and support locations.

WINNIPEG'S ADVANTAGES FOR STANDARD AERO

Strong support at all levels of government including:

Advantageous tax structures

Government-sponsored training programs to offset wage costs while employees are in training.

Excellent government support for loans on large capital acquisitions.

Winnipeg is a growing logistics hub, with three rail lines, trucking freight, and flights between Asia and North America via polar routes. With CentrePort, Canada's first foreign trade zone, there is great opportunity to assemble products in Winnipeg, for shipping to international markets.

Winnipeg's highly diverse economy that has maintained stable growth, even through the 2008-2010 economic recession.



Aveos is a full-service maintenance, repair and overhaul (MRO) provider of airframe, engine, component and maintenance solutions. From maintenance facilities across Canada and in El Salvador, Aveos provides integrated service solutions to more than 100 customers, while focusing on building a robust network of strategic alliances. Approximately 4,900 employees are committed to a tradition of providing world-class quality and expertise to customers across the Americas.

AVIATION RESOURCES

WINNIPEG JAMES ARMSTRONG RICHARDSON INTERNATIONAL AIRPORT (IATA: YWG, ICAO: CYWG) is the eighth busiest airport in Canada by passenger traffic, serving just over 3.3 million passengers, and the 12th busiest airport by aircraft movements. It is a hub for Calm Air, Cargojet, Kivalliq Air, Perimeter Airlines and Purolator as well as a focus city for Air Canada Jazz and WestJet.

An important transportation hub for the province of Manitoba, Winnipeg James Armstrong Richardson International Airport is the only international airport within the province. It is a multi-modal facility and one of several airports in Canada that is fully operational 24 hours a day, 7 days a week. The airport is operated by the Winnipeg Airports Authority as part of Transport Canada's National Airports System and is one of eight Canadian airports that have US Border Pre-Clearance Facilities. There are two asphalt runways, with lengths of 2,652 and 3,353 metres.

ST. ANDREWS AIRPORT (ICAO: CYAV) is a general aviation facility 10 miles north of Winnipeg. It is ranked the 15th busiest Canadian airport by aircraft movements. It has three asphalt runways with lengths of 916 metres, 915 metres, and 878 metres.

DEVELOPMENT AND TRAINING

Winnipeg is home to two world-class universities, the University of Manitoba and the University of Winnipeg as well as the province's leading applied sciences college, Red River College. More than 42,000 students are currently enrolled at the city's post-secondary learning institutions which offer a variety of education and training programs that meet the diverse needs of the aerospace sector and ensure a steady supply of highly-skilled workers available to the aerospace sector.

Key resources for the aerospace sector include:

The **CENTRE FOR AEROSPACE TECHNOLOGY AND TRAINING (CATT)** is an applied research venue in which students encounter real-world aerospace industry problems that are explored and solved. The centre is a public private partnership in which Red River College provides access to academic resources (including the training of operators, technicians, and engineering technologists) and StandardAero provides the facility, equipment maintenance, shop access and supplies, as well as trained operators and on-the-job trainers for project support.

RED RIVER COLLEGE STEVENSON CAMPUS (WINNIPEG)

Since 2002, the Stevenson Aviation and Aerospace Training Centre has been uniquely equipping students to enter the aerospace labour force in Winnipeg. Programs include aerospace manufacturing technician, aircraft maintenance, gas turbine engine repair and overhaul, aircraft structural repair technician, aircraft maintenance engineer diploma program, AME "M" apprenticeship, and non-destructive testing.

With a \$4.4 million investment in 2011, the new **CENTRE FOR NON-DESTRUCTIVE TESTING** at Red River College will provide specialized inspection equipment and a network of portable 'non-destructive' imaging equipment that can be used by industry in their own facilities. This equipment allows companies to detect hidden flaws in materials more efficiently and with greater confidence without damaging the materials.





UNIVERSITY OF MANITOBA

THE UNIVERSITY OF MANITOBA is the province's largest university with over 20 faculties which educate students in the areas of **engineering, business, mathematical sciences and other disciplines critical to the aerospace sector.** The university is comprised of a faculty and staff of 8,000 and offers educational programs to more than 26,000 students.

FACULTY OF ENGINEERING

The Faculty of Engineering at the University of Manitoba is a centre of excellence in interdisciplinary engineering research and application. The faculty offers students opportunities for hands-on industry training through paid, co-operative learning programs in which students complement their education with paid work experience in their chosen field. The faculty offers a diverse set of undergraduate degree programs in the fields of biosystems, civil, electrical, computer, and mechanical engineering and offers students the option to concentrate studies in the fields of manufacturing and aerospace.



ENGINEERING RESEARCH LABORATORIES

The Department of Mechanical and Manufacturing Engineering is home to several outstanding research laboratories. The **Applied Mechanics and Design Laboratories** conduct research in a broad number of fields covering topics such as nano-mechanics, stress and vibration analysis, and human-gait analysis. The **Materials Science and Engineering Laboratories** have become a Canadian leader in conducting research and development into composites and composite-related structures. The lab houses significant capability to conduct research in areas such as the joining of aerospace materials, mechanical testing which includes tensile, fatigue and hardness testing, fabrication, metallography and a host of processes surrounding composite manufacturing and processing. The **Manufacturing and Production Laboratories** actively conduct research into such fields as robotics, system integration, information systems and teleoperation. One of the highlights of the laboratory is its **Rapid Prototyping Laboratory** which allows for rapid manufacture of multi-purpose models or prototypes to be used for testing and design. The **Thermofluids and Energy Laboratories** contain facilities which support research into such fields as turbulence, computational fluid dynamics and heat transfer modeling, and alternative energy.

ELECTRICAL AND COMPUTER ENGINEERING

The Faculty of Engineering's Department of Electrical and Computer Engineering conducts research in fields such as applied electromagnetics, computational intelligence, microelectronics, nanofabrication and nanosystems fabrication, scanning probe microscopy, and other advanced fields of electronics. The department is active in partnering with TRILabs, one of Canada's leading firms in generating innovative technology solutions and new intellectual property.

To learn more, visit: www.umanitoba.ca

UNIVERSITY OF WINNIPEG

Consistently ranked in the **top 10 in the country** by both Maclean's magazine and The Globe and Mail newspaper, the University of Winnipeg is a leader in academic excellence, aboriginal education, applied computer science, engineering, physics, and theatre and the arts. More than 10,000 undergraduate and graduate students attend courses at the University of Winnipeg, which employs a faculty and staff of more than 700.

APPLIED COMPUTER SCIENCE

The Faculty of Science at the University of Winnipeg is home to the **Department of Applied Computer Science**. The Faculty of Science offers a masters degree in applied computer science and society, as well as bachelor of science or bachelor of arts degrees in one of two streams of learning: information systems or health informatics. Graduates from the faculty are typically employed in professions such as database administration, systems analysis and design, project management, and quality assurance.

INTERNATIONALLY-RECOGNIZED ENGINEERING EDUCATION

The University of Winnipeg has teamed up with the University of Minnesota to offer a **dual engineering degree program** from one of the top engineering universities in North America. University of Winnipeg students who complete a bachelor of science degree may attend the University of Minnesota's College of Science and Engineering program, where they will study for an additional two years, earning a dual engineering degree. The degrees granted are a bachelor of science from the University of Winnipeg and a bachelor of engineering from the University of Minnesota, and enable students to apply for licensure as a professional engineer in Canada. Studies emphasizing aerospace engineering, computer and electrical engineering, materials science engineering, and several other fields are available to participants.

For more information, visit: www.uwinnipeg.ca

Economic Development Winnipeg Inc.





RED RIVER COLLEGE

RED RIVER COLLEGE (RRC) is Manitoba's largest institute of applied learning with 32,000 enrollments across more than 110 programs. In the past five years, RRC has graduated more than 1,000 students from programs that are directly applicable to the aerospace sector.

RRC works closely with industry and employers to ensure that graduates have the right skills and knowledge to contribute successfully in the workplace. Successful partnerships have helped graduates to achieve a 97% graduate employment rate. RRC partners with Winnipeg's aerospace industry to create mutually beneficial programs in which its students gain practical, relevant, hands-on knowledge and training that provides employers with a highly-skilled workforce. An example of this is found in RRC's Centre for Aerospace Technology and Training (CATT), located on-site at StandardAero's Plant 5 facility in Winnipeg, and one of only three such facilities in North America. The CATT houses cutting-edge laser machining equipment, vapour phase crack cleaning and coating equipment, as well as digital inspection equipment, all of which are a critical part of aerospace and component repair procedures.

For more information, visit: www.rrc.mb.ca

AEROSPACE NETWORKS

Winnipeg is home to a number of professional associations and industry groups which have an interest in advancing the aerospace sector in Manitoba. As the capital of Manitoba, Winnipeg is also home to several government agencies which play an integral role in the aerospace sector in Manitoba.

MANITOBA AEROSPACE ASSOCIATION (MAA) represents 40 aerospace companies and partners and facilitates sustainable worldwide business growth of Manitoba aerospace companies while also fostering responsible, collaborative community support. The MAA along with its sister organization, the Manitoba Aerospace Human Resources Coordinating Committee (MAHRCC), strives to assist companies in fostering business opportunities and attracting and developing a skilled workforce that is capable of continuous process improvements to ensure globally competitive products and services.

www.manitoba-aerospace.mb.ca

In June of 2010, the **CANADIAN COMPOSITES MANUFACTURING RESEARCH AND DEVELOPMENT CONSORTIUM (CCMRD)** launched. This aerospace R&D group, administered by the Composites Innovation Centre in Winnipeg, is comprised of a number of industry partners, including Boeing, Bristol Aerospace, Bell Helicopter, Avior Integrated Products, Comtek Advanced Structures, Convergent Manufacturing Technologies, and Profile Composites.

THE MANITOBA AVIATION COUNCIL (MAC) is an organization representing the aviation community in Manitoba. Its members include representatives from airports, air operators/carriers, and those who service, maintain and repair aircraft. The MAC mission is to promote, facilitate and protect the development of all facets of aviation within the province of Manitoba.

www.manitobaaviationcouncil.ca

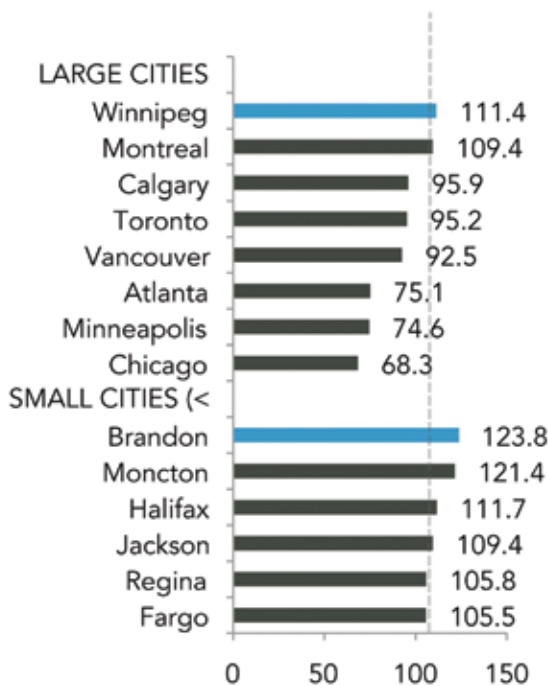
THE MANITOBA AEROSPACE HUMAN RESOURCE COUNCIL (MAHRC) is an industry-driven, government-supported initiative aimed at developing a world-class workforce to meet industry's needs through partnerships with Manitoba educational institutions, Manitoba Aerospace and other key stakeholders. MAHRC is committed to facilitating positive change in Manitoba's aerospace sector and beyond in the area of training and human resources services by working with industry, individuals, institutions and governments.

www.manitoba-aerospace.mb.ca/aboutus/about_mahrcc.html

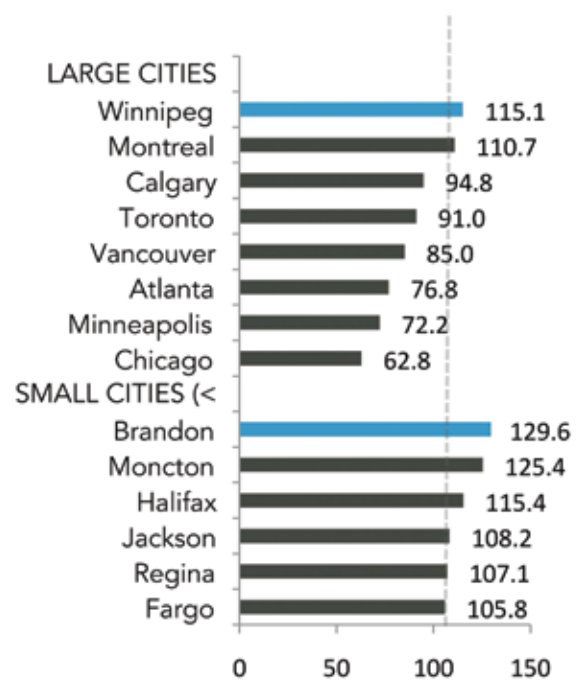
OVERALL COMPETITIVENESS

Overall competitiveness is compared by calculating internal rates of return, which are commonly used by business in making investment and location decisions. A higher internal rate of return indicates a city is more competitive than others. Internal rates of return for each city are calculated using start-up costs and cash flow over a 20-year period, specific to a smaller and a larger manufacturing firm, then discounted using applicable Canadian and US commercial interest rates. The following charts illustrate the combined impact of taxes and costs on the internal rates of return for the representative smaller and larger manufacturing corporations in the selected jurisdictions.

**Figure 2: Internal Rate of Return
Small Manufacturing Firm**



**Figure 3: Internal Rate of Return
Large Manufacturing Firm**



Source: Manitoba Finance 2011

Manitoba maintains a **highly competitive overall business cost and tax environment** for both smaller and larger firms engaged in manufacturing and processing. The internal rates of return for both Winnipeg and Brandon are above the overall average of the cities included in the study. Among cities with populations over 500,000, **Winnipeg has the highest internal rate of return** for both smaller and larger manufacturing firms. Brandon has the highest internal rate of return, overall, for all cities compared.

R&D TAX INCENTIVES AND FINANCIAL SUPPORT

MANUFACTURING INCENTIVES

The Manitoba Manufacturing Investment Tax Credit provides (MITC) a 10% tax credit applicable against Manitoba corporate income tax payable. This credit is for new and used manufacturing buildings, machinery and equipment used directly in the manufacturing process. Qualified investments must be made prior to December 31, 2014.

The amount deductible against Manitoba income tax will be the lesser of the 10% investment tax credit or the Manitoba Corporate Income Tax otherwise payable. Unused investment credits can be carried forward up to 10 years, or carried back up to three years. This allows firms without taxable income to take immediate advantage of the MITC.

Beyond these incentives there are a variety of incentives available to manufacturers in Manitoba including grants, loan guarantees, wage subsidies, and equity investments.

R&D TAX INCENTIVES

The tax environment in Manitoba encourages industry to continuously develop new and innovative products and processes. The Manitoba Research and Development Tax Credit and the federal Scientific Research and Experimental Development Tax Credit (SR&ED) provide Manitoba companies with considerable leverage for their R&D investments. Studies by the Conference Board of Canada comparing the R&D tax incentives among the world's industrialized countries have repeatedly found that combined federal and provincial R&D tax incentives in Canada are the "most generous and stable offerings in the industrialized world."

To encourage research and development in Manitoba, the Research and Development Tax Credit provides a 20% non-refundable tax credit applied against Manitoba corporate income tax payable. Eligible corporations must incur qualifying scientific research and development expenditures (as defined for federal income tax purposes) in Manitoba. The amount deductible against Manitoba income tax will be lesser of the Manitoba R&D Tax Credit and the Manitoba Corporate Income Tax otherwise payable. Any unused credit will be available for carry-forward for up to 10 years, with carry-back for up to three years.

For more information on the Manitoba Research and Development Tax Credit, please visit the Manitoba Department of Finance at: www.gov.mb.ca/finance/ccredits.html

R&D TAX INCENTIVES AND FINANCIAL SUPPORT

SCIENTIFIC RESEARCH AND EXPERIMENTAL DEVELOPMENT (SR&ED) TAX INCENTIVE PROGRAM

The SR&ED program is a federal tax incentive program, administered by the Canada Revenue Agency (CRA), which encourages Canadian businesses of all sizes, and in all sectors to conduct research and development (R&D) in Canada. It is the largest single source of federal government support for industrial R&D.

The SR&ED program gives claimants cash refunds and/or tax credits for their expenditures on eligible R&D work done in Canada. Claimants can apply for SR&ED investment tax credits for expenditures such as wages, materials, machinery, equipment, some overhead, and SR&ED contracts.

Generally, a Canadian-controlled private corporation (CCPC) can earn an investment tax credit (ITC) of 35% up to the first \$3 million of qualified expenditures for SR&ED carried out in Canada, and 20% on any excess amount. Other Canadian corporations, proprietorships, partnerships, and trusts can earn an ITC of 20% of qualified expenditures for SR&ED carried out in Canada.

For more information on the Scientific Research and Experimental Development (SR&ED) Tax Incentive Program, please visit the Canada Revenue Agency at: www.cra-arc.gc.ca/sred/

INDUSTRY EXPANSION PROGRAM

The Industry Expansion Program is aimed at supporting companies that are locating new operations in Manitoba or expanding existing operations. The program assists companies by contributing to their investment in skills training for employees. Financial assistance may be available to businesses to pay for eligible expenditures related to the development and delivery of appropriate training for employees. Support under this program is custom-prepared on a client-by-client basis. The amount of funding assistance provided is based on the creation and maintenance of quality jobs and the economic benefit to Manitoba resulting from these new employment opportunities. Funding is not available for ongoing routine business costs (e.g. operational, administrative, maintenance, recruitment, capital costs, or salaries), research or scoping activities, and activities that have already occurred.

For more information on the Industry Expansion Program, please visit: www.gov.mb.ca/tce/iwd/pdf/industry_exp.pdf

R&D TAX INCENTIVES AND FINANCIAL SUPPORT

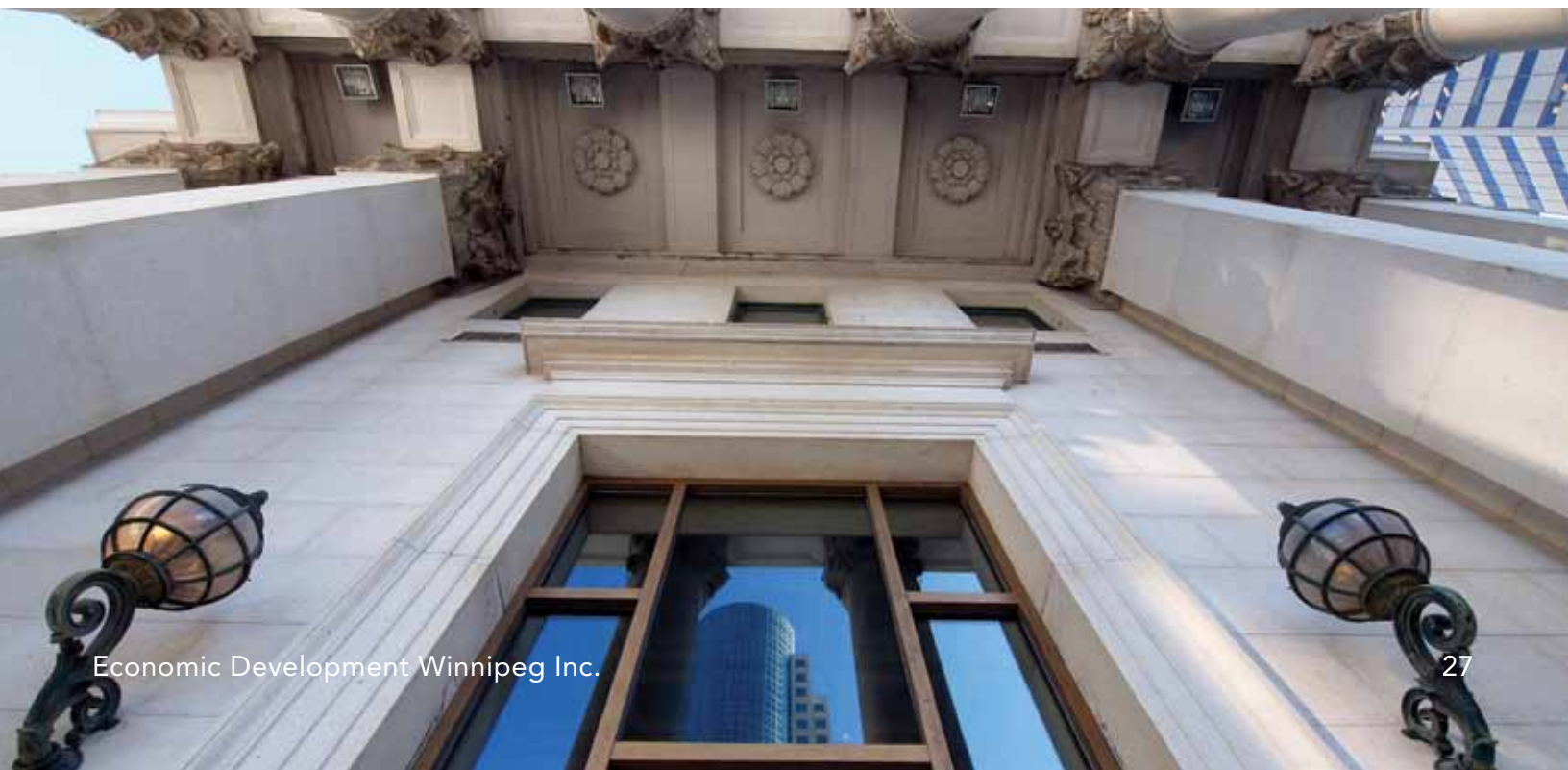
INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)

Canada's nearly two million small and medium-sized enterprises (SMEs) are the key drivers of job and wealth creation in all sectors of the nation's economy. One of National Resource Council Canada's (NRC) primary objectives in stimulating wealth creation in Canada is to link its diverse networks, programs and infrastructure to SMEs to help them access, develop and exploit new technologies and knowledge essential for their growth and prosperity. NRC's primary vehicle for stimulating the innovation capabilities of SMEs is its Industrial Research Assistance Program (NRC-IRAP). Regarded worldwide as one of the best programs of its kind, NRC-IRAP is a vital component of NRC's innovation strategy and a cornerstone of Canada's innovation system.

This program stimulates wealth creation through technological innovation by providing technology advice, assistance and services to SMEs to help them build their innovation capacity. NRC-IRAP brings together a diverse network of organizations, services and programs to help Canadian SMEs develop and exploit technologies in the competitive, global, knowledge economy. Through expert technical and business advice, financial assistance, access to business information, contacts, and national and international networks, the program provides customized solutions to some 10,000 SMEs annually.

For more information, please visit the National Resource Council at:

www.nrc-cnrc.gc.ca/eng/ibp/irap/about/index.html





LEADERSHIP IN LEAN MANUFACTURING

Manufacturers in Winnipeg benefit from one of the best lean manufacturing training and networking systems in North America, led by Canadian Manufacturers and Exporters – Manitoba Chapter (CME-Manitoba). CME-Manitoba offers a wide variety of lean manufacturing training and lean consulting services.

Winnipeg's low factor costs and skilled management and workforce have contributed to Boeing's facilities in Winnipeg being consistently ranked **#1 in lean manufacturing** across all Boeing manufacturing units worldwide

WINNIPEG AEROSPACE

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