

The Vital Connection: Reclaiming Great Lakes Economic Leadership in the Bi-National US-Canadian Region

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The bi-national Great Lakes region can continue to model what economic regions will look like in the global economy—and also how they can thrive. To realize this vision will require leadership and purposeful actions that acknowledge the unique opportunities provided by the Great Lakes economy. Only the U.S. president and Congress, along with the Canadian prime minister and Parliament, can promote understanding of the economic opportunities to be realized. Working together, and working with federal leadership, the opportunity is real for the Great Lakes region to forge a new economic leadership position, and serve anew as a model for world economic and social innovation.

I. Introduction

The Great Lakes economic region, comprised of the U.S. states bordering the Great Lakes, the upper Mississippi and Ohio watersheds, and the Canadian provinces of Ontario and Quebec, has a storied economic history.¹

The waterways of the five Great Lakes—along with the Ohio, Mississippi, and St. Lawrence river systems—first connected the rich natural bounty of North America's interior with the ocean and the rest of the world. Later, the conversion of abundant resources to processed agricultural and finished manufactured goods made the Great Lakes region an industrial colossus, and placed it at the center of U.S. and Canadian economic development. The area has served as the launching pad for new industries and innovations, birthing the oil, steel, auto, and aviation industries; leading the global “green” agricultural revolution; and boosting such recent technological “game-changers” as the Internet.

Unique to this relationship has been a largely invisible boundary, historically the longest unguarded border between two nations. Understanding their economic interdependence, the region was a first mover to open markets—from early reciprocity agreements to the U.S.-Canadian Auto Pact (1965), the U.S. Canadian Free Trade Agreement (1989), and the North American Free Trade Agreement (1994). The resulting interaction and free flows of people, capital, ideas, and goods across the border enabled the growth of great industries, gave rise to a strong blue-collar middle class, and created the largest bi-national economy on earth.

Yet for all this, the economic primacy of the United States and Canada, and especially the Great Lakes region, has been challenged in recent decades by the globalizing economy, fast-rising economic competitors, domestic and international demographic shifts, and pressures on natural resources and climate change. The two countries also face the new challenge of protecting against terrorism along a border once among the most (happily) porous on earth.

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“To realize the latent economic opportunities of the region, both the U.S. and Canada require more than the well-intentioned slow-walk of the existing Security and Prosperity Partnership dialogues of the past three years.”

In this new economic and security environment both countries can—and should—once again turn to the Great Lakes region for leadership and new opportunities:

- As a leading center for research and innovation, the Great Lakes can invigorate the U.S. and Canadian economies through new discovery in fields of health, science, materials, and communications
- As the primogeniture of the world’s carbon economy, the region has a special economic opportunity—and responsibility—to be a leader in developing the technologies that can improve the global climate (through energy, automotive, and transport) and be good stewards of natural resources (through freshwater, agriculture, and bio-science).
- As a center for human capital development and talent generation, the region can help educate the skilled professionals needed to keep both countries’ economies at the top of the economic food chain in the 21st century, providing new generations with economic opportunity while allowing space for workers across the country and around the globe to learn, grow, and earn a decent standard of living.
- As the home of the largest grouping of interior lakes in the world, the region can uncover its “freshwater coast” from underneath the obsolete mills, factories, and brownfields of the industrial era, and create a new model of sustainable, amenity-rich development.
- As a tightly integrated economic area, the Great Lakes region can serve as a model for building a thriving, globally-engaged, bi-national economy across international borders, while maintaining homeland security.

In 2005 the Brookings Metropolitan Policy Program, in partnership with a network of academic, public policy, business and civic organizations, began a multi-year research and policy development initiative—the Great Lakes Economic Initiative—aimed at helping federal and state leaders to recognize and build on these assets and ultimately improve the future economic vitality of the Great Lakes region.²

As outlined in *The Vital Center: A Federal-State Compact to Renew the Great Lakes Region* (published in October 2006) the Great Lakes region has made a partial but incomplete transition from a global industrial powerhouse to a major player in today’s global knowledge economy. The *Vital Center* did much to build understanding of the unique shared economic storyline of the U.S.-side of the Great Lakes region, and to develop recommendation for how U.S. domestic public policy could help nurture the region’s economic transformation.

Shortly after the release of the *Vital Center*, the Canadian government joined with Brookings to develop this updated report, which, with the aid of Canadian scholars, leaders, and government officials, incorporates data analysis and policy recommendations from the Canadian side of the bi-national Great Lakes region. The report elevates what is at stake for the states and provinces of the Great Lakes region, and ultimately for both countries. In doing so, it seeks:

- To inform and help national political leadership on both sides of the border to appreciate and animate the latent economic power in the Great Lakes region
- To forge understanding and move policies that would have significant, positive economic benefits for both countries and that would be uniquely helpful to the positive economic transformation of the bi-national Great Lakes region
- To arm private and public sector leaders within the Great Lakes with credible and reliable data and analysis that can inform federal, and state/provincial policy

The report begins with a summary of the shared economic and social development history that makes the Great Lakes region unique. It then offers new analysis of the regional economic assets and opportunities that, if fully leveraged, can help drive U.S. and Canadian economic prosperity. Finally, it offers a short set of ambitious, necessary, and doable recommendations for how U.S. and Canadian leadership can help strengthen the bi-national economic relationship in the Great Lakes region, and, in the process, increase the competitiveness of both nations. These recommendations are particularly targeted at the Canadian prime minister and the next U.S. president and administration, the latter of which will be elected in 2008 with the help of the large, vote-rich swing states of the Great Lakes. It is a timely call for them to articulate bold, tangible goals, and provide the leadership needed to realize them.

II. A History of Economic Interdependence and Shared Development

The Great Lakes region's many economic opportunities are conditioned by the particular economic and social history of the area—a story characterized by strong economic interdependence and shared growth.

Europeans colonize the region and exploit its natural bounty

When Europeans first explored the North American continent, their access came through the Great Lakes water-system, the borders of which were already densely settled by native communities, and rich with trade and transportation links.

Explorers, trappers, traders, and the royal and commercial interests of France and England rode the water courses to find, reap, and claim valuable resources, enlisting tribal allies on all sides. Brulé, Champlain, Hudson, and other explorers “discovered” the Great Lakes region in the eyes of Europeans; traders and settlers followed them to their early outposts.

Following the French-Indian war and the Treaty of Paris in 1763, Britain replaced France in dominion over Quebec province (Quebec City soon celebrates its 400th birthday). When the populous seaboard American colonies, already eyeing the rich hinterlands to the West, broke away from Britain, another Treaty of Paris in 1783 ceded much of Quebec to the Americans.

The third U.S. president, Thomas Jefferson, sought to open up new regions for development to make a healthier country, to afford room to grow, and to provide the opportunity for democracy to flourish, peopled as it was to become by his “yeomen” farmers. This vision was made real in the form of the Northwest Ordinance, which organized the former pieces of Quebec province, and set forth social values of free labor, strong education, and local governments close to the people—attributes which would fuel the development of the rapidly settling American “frontier.”

The shift from French to British allegiance brought to the Canadian provinces the markets of the British Empire and a rapid growth in commerce. By 1798, wheat was becoming an important export crop; heavy imports received at Montreal and Quebec went to upper Canada and to the Indian Country, and to the American west via the St. Lawrence.

The dense forests of the region were leveled, creating as byproducts new infrastructure (roads and rails), new resources, and new settlements to the region. During the early 1800s, timber became Canada's chief export, and the white pines in the new states of Minnesota, Wisconsin, and Michigan were put to the axe.

Settlement of the region also unearthed vast mineral deposits, from copper to iron ore. Commercial oil production began with wells at Oil Springs, Ontario in 1858, and the more celebrated Titusville in Northwest Pennsylvania in 1859.

Infrastructure and innovation fuel Great Lakes economic development

The region's lakes, rivers, and their tributaries formed the initial natural infrastructure for settlement and commerce. Timber floated down the region's rivers. Pelts and grains were transported by ship and barge. The Great Lakes found world markets through the St. Lawrence, the Ohio, and Mississippi watersheds through New Orleans. Fast growing cities throughout the region emerged as trading outposts and processing centers on lakes and riverfronts.

The engineered infrastructure of the region, including canals, locks, ports, and later, roads and rails, steered trade routes, accelerated development, knit together the Great Lakes region, and provided faster outlets to the world. As agriculture flourished, big, speculative (and often winning) bets were made financing new canals. Several radically changed the economic equation: The Erie Canal linked the Great Lakes systems directly to New York (1825), the Welland Canal linked the Great Lakes to the St. Lawrence (1830), the Tideau canal linked Ottawa and the Great Lakes (1832). Finally, in 1900, the Chicago Sanitary and Ship Canal (also known as the Chicago Drainage Canal) and, in a marvel of engineering, the reversal of the Chicago River, linked the Mississippi to the Great Lakes.

Both national governments empowered private firms to lay the rail network that accelerated national settlement and development. Home to the world's richest arable lands, the development of the Great Lakes and Midwest was also aided by innovative policies to support settlement by family

farmers. Both countries essentially gave away the land, unheard of elsewhere in the world: The U.S. Homestead Act of 1872 gave anyone willing to settle the land 160 acres at a nominal fee; Canada's Dominion lands policy came a few years later, offering 160 acres for only \$10 to those willing build a house and cultivate the required acreage.

Growth in the Great Lakes region was also fueled by relatively open-door immigration policies. Migrants (many of whom were skilled artisans) came from Europe and elsewhere to escape feudal and class systems, get cheap land, and find employment on the farms, and in the mines, mills, forests, and growing factories. Canadian timber trading vessels returned with massive numbers of European immigrants in the 1830s and 1840s. Northern Europeans settled the lands of the upper U.S. Midwest, followed by dramatic numbers from Eastern and Southern Europe during the late 1800s and early 1900s as the rising cities and the burgeoning factory towns of the region drew workers from around the globe.

Economic interdependence leads to new political and economic collaboration

The highly interconnected economy of the region led successfully to pressure for the first bi-national agreement for reciprocity in emerging industries: the Reciprocity Treaty of 1854. Under this treaty, which lasted until the next wave of protectionism after the U.S. Civil War, the United States and the British North American colonies (Canada, New Brunswick, Nova Scotia, Prince Edward Island, and New foundland) removed the duties upon a considerable list of natural products, including grain, flour and breadstuffs, animals, meats, fruit, fish, poultry, tallow, coal, timber, and lumber. American fishermen were admitted to the colonial fisheries on the Atlantic coast, while British subjects received a similar privilege in eastern American coastal fisheries north of the thirty-sixth parallel. British and American shipping had access, upon equal terms, to the St. Lawrence, the Canadian canals, and Lake Michigan. The treaty undoubtedly imparted a considerable impetus for trade between the United States and the colonies, which more than doubled between 1854 and 1865, and can be viewed as a precursor to today's free trade agreements.³

Political development in both countries was shaped by the growing economic power and population growth of the Great Lakes region. The election of Abraham Lincoln of Illinois as president of the United States in 1860 in essence cemented the alliance of the agricultural and industrial Midwest with the Northeast, while rejecting the economic organization of the South based on slavery. East-West commercial, industrial, and infrastructure links were strengthened during the U.S. Civil War, helping move the Great Lakes region to center stage of the economic and social development of the country.

Similarly, economic opportunity and necessity helped drive the Canadian provinces to Confederation. In 1867, Ontario and Quebec leadership persuaded the more reluctant colonies of New Brunswick and Nova Scotia to create the Dominion of Canada. The opportunity to connect the provinces and their marketplaces with rail lines was a driving force behind the Confederation, as was the desire to develop an independent economic and political counterweight to the strong and growing America and ward off any thoughts of American "manifest destiny" extending to Canadian provinces.

As the canals and railroads across the upper Midwest and Great Lakes accelerated the rise of the American economy, the Canadian Pacific Railway, finished in 1885, brought the East-West link across Canada. Very shortly thereafter these railroad links were tied into the American network as well, binding the bi-national region together. Additional infrastructure was co-developed in the region, including the decades-long joint effort to enhance the St. Lawrence seaway, which culminated in 1959 with the whole route becoming accessible for deepwater global shipping. Similarly, the Soo Locks at the apex of the Great Lakes, first constructed by the French in 1741, have become a bi-national enterprise, and the busiest locks in the world.

Great industries and cities emerge

New migrants, growing amounts of capital, and the region's well-developed system of transportation supported fast-evolving industrial development. Flour milling, brewing, distilling, and lumber milling led to new farm equipment manufacturing, and boiler and steam engine production, which in turn nurtured metalworking and machine-making. This allowed for the production of new machine tools, carriage manufacturing, furniture making, tractor production, and the world changing development of the automobile and assembly line in Detroit in the early 1900s. The emergence of these factory-based

industries generated rapid growth of the workforce and wealth, which in turn fueled the rise of major new cities across the region—Buffalo, Pittsburgh, Cleveland, Detroit, Ft. Wayne, Chicago, Davenport, Milwaukee, St. Paul and many more. Over time these cities became famous not simply as centers of production, but as centers of culture and innovation.

Innovation and exploitation of raw materials produced the first great vertically integrated industries in processed foods, steel, autos, and farm equipment; and Rockefeller, Massey-Ferguson, Seagram, Carnegie, Heinz, and Ford became familiar names. These industries grew across the American-Canadian border. For example, shortly after pioneering the assembly line in Detroit, Henry Ford arranged in 1903 for automotive assembly across the river in Windsor to serve the British Empire.

On both sides of the border the burgeoning factory economy, and the rise of the factory worker, help spawn corollary labor movements that grew to scale in the industries of the Great Lakes region. Canada's Trades and Labor Congress was founded in 1883 on the initiative of the Toronto Trades and Labor Council, bringing Ontario's labor organizations together, and providing the basis for Canada's national labor movement. In America, the key meetings forging the first American Federation of Labor were in Terre Haute, Indiana and Pittsburgh, Pennsylvania. Later the great industrial unions in steel, autos, and machining grew in the region—and defined its culture. These movements forged a wholly new employer-employee compact, and spurred attention to worker rights, civil rights, and a safety net of pensions, health care, and unemployment benefits.

The region becomes a center for education and learning

Important learning infrastructures were developed in the region to extend education to “everyman” and fuel economic development. In the United States, the Morrill Land Grant College Act of 1862 gave the new “Western” states land to sell in order to create higher learning institutions specifically designed to support agricultural and industrial innovation and dissemination, and allow millions to reap the benefits of public higher education who otherwise could not afford to do so.⁴ In Canada, early Royal Charters of McGill University (Montreal, 1821), and University of Toronto (1827) begin the process of world-class higher education institution building in Canada.

Path-breaking economic agreements are forged

During the 20th century a thriving economic region continued to develop in the Great Lakes. As this highly integrated economy grew, additional pioneering agreements were forged to fuel cross-boundary economic integration.

In 1965, the Canada-U.S. Auto Pact (1965) liberalized and fueled the cross-border traffic in auto parts. Later, the ground-breaking Canada-U.S. free trade agreement of 1989 led to the continent-wide North American Free Trade Agreement (NAFTA) in 1994, accelerating economic growth and productivity gains on both sides of the border. Since NAFTA's implementation, total two-way merchandise trade between the United States and Canada has more than doubled.

Still, the economic health of the region is today uncertain.

III. The Region Today: An Economy in Transition

The Great Lakes region has played a dominant role in the United States' and Canada's respective national competitive postures, creating signature industries and a vast middle class, and in many ways defining both countries' economies and culture for several generations. Taken together, the provinces and states of the Great Lakes form the globe's largest bi-national economic region.

This economy is experiencing a transition, however—from an era of familiar and comfortable industrial dominance, to a current period of uncertainty marked by new challenges and opportunities. Since the 1970s, the advent of a newly competitive world auto industry, growing global competition in the region's traditional manufacturing sectors, oil price shocks, and rapid advances in worldwide business and communications technology have shaken the foundations of the region. And since 9/11, measures to tighten border security have complicated and slowed the flows across what once was the world's most open border.

The Great Lakes region's economic history as king of the factory economy has created a unique set of challenges. For example, there exists a long legacy of local communities and cultures acclimated to earning a good, predictable living without a higher education. Physical legacies of the industrial era—remnants of old factories, obsolete infrastructures—mask assets such as waterways, lakefronts, and valuable urban real estate. And much of the region—particularly rural areas and small- to medium-sized manufacturing-based communities—face a significant “brain-drain” of young educated workers as they flee to the faster-growing, more dynamic urban economies both within and outside of the region.

Yet, the legacies of the factory economy are not all negative. The major cities to which it gave rise have certain advantages in the new, knowledge-intensive and innovation-based economy if those advantages are properly exploited. Large and dense metropolitan areas are attractive to high-wage employers because 1) firms tend to locate in places that are big enough to offer easy access to an educated workforce; 2) firms tend to cluster in order to take advantage of the specialized suppliers that develop in response to the presence of similar firms; and 3) the clustering of firms promotes innovation, which in turn enables industry in that region to grow and prosper.

Educated youth and young couples launching their careers gravitate to metropolitan areas because 1) they correctly expect to change jobs and employers often and so value the employment options that exist in larger places; 2) only large labor markets allow couples to coordinate two careers and still live together; and 3) today's youth in general like the recreational and lifestyle choices available in cities. This is why 65 percent of the U.S. population lives in the 100 largest metropolitan areas, 75 percent of graduate degree holders live in them, and why 363 officially defined metropolitan areas in which 83 percent of the population lives account for 90 percent of the country's gross national product.⁵

These transitional trials for the region exemplify the kind of challenges and anxieties both the United States and Canada face in a rapidly transforming world economy. The two nations face slightly different but significant national competitiveness issues:

- While the United States remains the most creative economy on earth, and the indisputable technology and innovation leader, the National Academy of Sciences notes in a recent report it is: *“deeply concerned that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength.”*⁶
- Canada, meanwhile, has a different struggle to foster a more dynamic and productive national economy. Canada's Conference Board warned recently: *“Innovation is fundamental in Canada's productivity and competitiveness. Yet we are performing poorly across almost all dimensions and ranking the bottom quarter in peer group comparisons”*

Both countries' leaders and citizenry are wondering what the rise of China, India, and the European Union mean, and have particular concerns over the significant growth in developing countries' abilities to take over routinized production and “knowledge work”. U.S. and Canadian world comparisons both show slumping investments in basic research and development, flagging production of talent in STEM (science, technology, engineering, math) disciplines necessary for new discovery, and often sluggish commercialization rates of development of new firms and jobs from new technologies. Finally, both countries are trying to move faster in developing the innovations and technologies that can afford sustainable economic growth, reduce carbon emissions, and smartly conserve valuable resources, including water and energy, upon which economic vitality and quality of life depend.

IV. Great Lakes Leadership for U.S. and Canadian Prosperity

There are many challenges facing the Great Lakes region, occupying as it does the frontline in global restructuring. But as it rises to meet these challenges, it can leverage assets vital in today's economy. These attributes make it uniquely equipped to contribute to the U.S. and Canada's broader economic prosperity and advance their economic engagement and leadership in the world.

These attributes are examined in turn and in detail here. They include the often overlooked realities that the Great Lakes region is:

- a huge international economy and marketplace;

- an unrivaled center of innovation, education and talent generation—particularly in areas of global concern such as energy medicine;
- a large and growing centrepiece for global trade, commerce, and exchange of people, ideas and technologies;
- blessed with a globally unique, water rich, and attractive natural environment; and,
- a large-scale laboratory for the new international economic security arrangements needed to be perfected around the world.

Huge marketplace and integrated economy

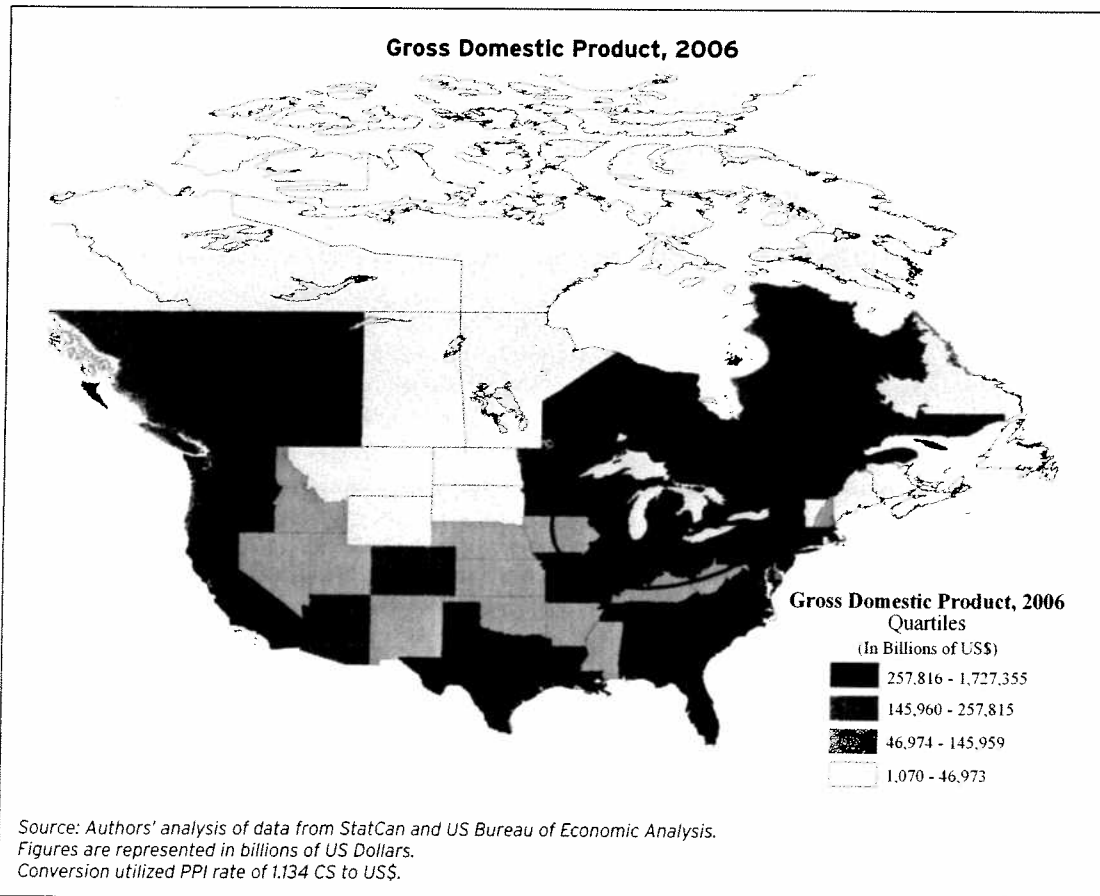
The sheer size of the Great Lakes region's economy is a huge asset for both nations. The combined population of the bi-national region makes up nearly 36 percent of the population of both countries. And if it stood alone as a country it would be the 2nd biggest economic unit on earth, second only to the U.S. economy as a whole and larger than Japan, the rising powers of China and India, and the traditional heavyweights of Germany, and the UK.⁸

Canada is the leading market for 39 of the 50 U.S. states, and ranked in the top three for another eight states. In fact, Canada is a larger market for U.S. goods than all 25 countries of the European Community combined, whose population is more than 15 times that of Canada.

Canada and the United States also have one of the world's largest investment relationships. The United States is Canada's largest foreign investor, and Canada is the seventh-largest foreign investor in the United States. Canadians invest \$US 165 billion in its southern neighbor, and Americans invest \$228 billion in Canada, or about 65 percent of total foreign direct investment in that country.⁹

Unrivaled innovation infrastructure

In an economic era in which continuing innovation is the source of economic prosperity, the Great Lakes region has unrivaled innovation infrastructure upon which to build. Its research horsepower, new



The Great Lakes Economic Region is home to over one-third of the combined population of the United States and Canada

	Population	Share of Canada/ U.S. Combined Total
GLER	118,377,375	35.7%
Canada	32,623,490	9.8%
United States	299,393,484	90.2%
Canada/U.S. Combined Total	332,021,974	

Source: Authors' analysis using data from StatCan and U.S. Census, 2006 population estimates

knowledge creation, and significant talent generation are vital assets both countries can tap for the future development.

Research and Development

The Great Lakes region is home to a huge amount of both countries' research and development: \$79,192 U.S. billion and \$18,881CAD billion for 2004.¹⁰

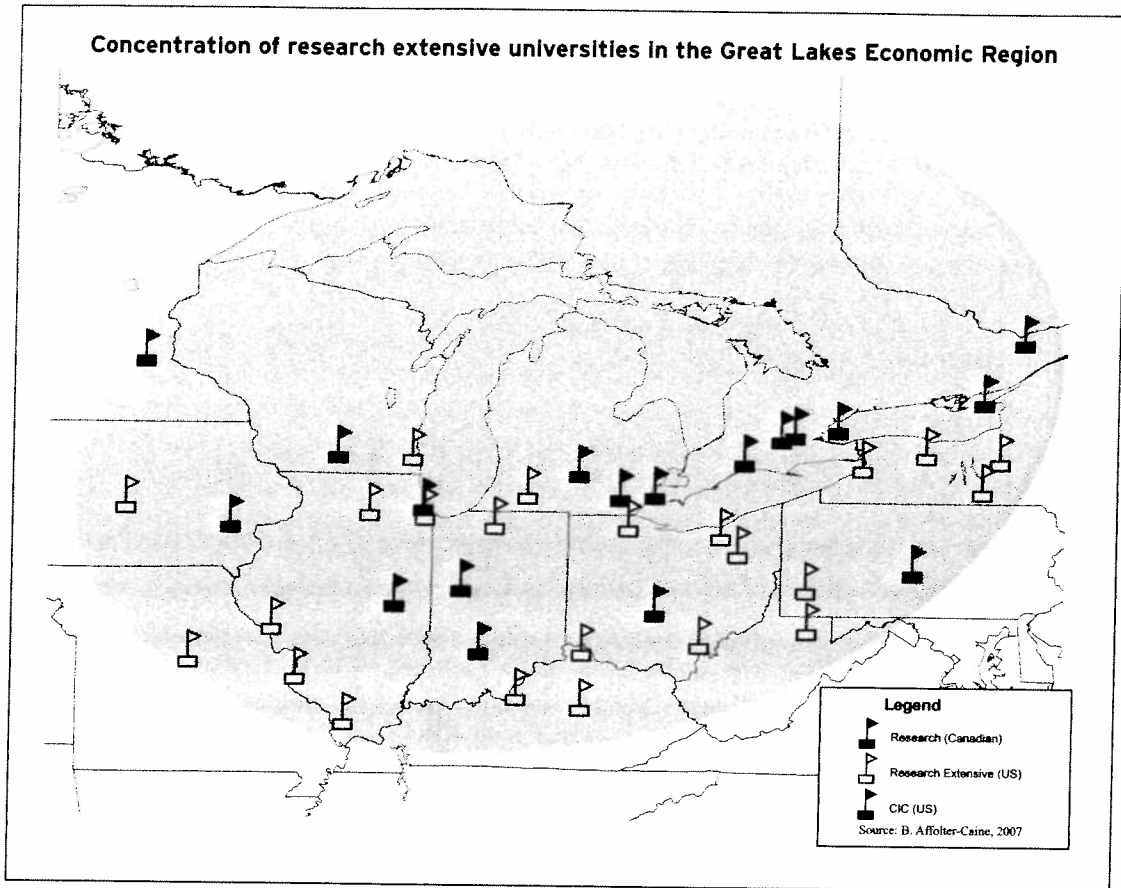
The U.S. portion of the Great Lakes region accounts for nearly 29 percent of the total research and development performed in the United States, while the Canadian portion of the Great Lakes region accounts for 77 percent of the total research and development performed in Canada.¹¹ The Great Lakes region conducts a greater share of research and development relative to its GDP than the United States and Canada as a whole, and outperforms the U.K., the EU, and China.¹²

Most research and development is done by private firms, which are continually developing new products and processes to boost productivity. Given its rich history of new industry creation and its number of globally connected firms, the region remains a decision and research and development center in key sectors of the economy. Over 30 percent of North American corporate headquarters and 40 percent of the world's top 2000 firms are headquartered in the region, serving as the "brains" for new business, product, and technology development.

In 2003, the number of jobs in the Great Lakes provinces directly involving research and development totaled almost 20,000, amounting to almost 87 percent of all Canadian jobs in this area. And in 2002, the Great Lakes states' share of total U.S. employment in high technology jobs was 34 percent, just slightly less than its share of total U.S. employment, and one that is higher than that of both the Northeast (19 percent) and the West (25 percent).¹³

Even manufacturing-heavy states of the Great Lakes, which are undergoing profound restructuring of their workforces, have a foundation of significant technology expertise. Michigan, hard hit by auto and related manufacturing restructuring, still ranked 10th in the nation by Cyberstate 2007, with 177,600 high-tech workers in 2006. Other Great Lakes states are also strong in employment of high-tech workers, including 15th ranked Ohio and 17th ranked Minnesota, and in high technology research and development, including 8th ranked Illinois and 12th ranked Ohio.¹⁴ At the same time, approximately two-thirds of all of Canada's professional, scientific, and technical services labor force is employed in the Great Lakes provinces, more than in any other Canadian region.¹⁵

The large amount of research and development emanating from the large-scale private-sector research base in the region works synergistically with a robust network of universities in the region. In fact, the region boasts more of the top ranked universities in the world than any comparable region. According to Institute of Higher Education at Shanghai Jiao Tong University, 20 of the top-ranked 100 universities in the world are Great Lakes institutions—compared with only 15 in the Northeast/Mid-Atlantic, and 13 on the West Coast.¹⁶



Colleges and universities in the Great Lakes Economic Region boast substantial research and development capacity

Geography*	Total R&D	Academic R&D (In Millions of U.S. Dollars)	GDP	Academic R&D	Academic R&D
				as Share of Total R&D	as Share of GDP
GLER	\$91,439	\$17,169	\$4,152,910	18.8%	0.41%
Canada	\$16,736	\$5,673	\$848,377	33.9%	0.67%
United States	\$277,577	\$39,976	\$10,923,849	14.4%	0.37%
Canada/U.S. Combined Total	\$294,313	\$45,649	\$11,772,226	15.5%	0.39%

Source: Authors' analysis using data from StatCan and NSF.

*Geography refers to the region, country, or combination of countries; therefore, the figures for Canada refer to the entire country whereas the figures for the GLER refer to just the provinces and states that are part of the GLER.

NOTE: Conversion for C\$ to US\$ for 2003 was calculated using 1.43355 C\$ to US\$, which is the median of currency conversion cash rate ratios for 2003 (1.5747 low and 1.2924 high C\$ to US\$ reported by the Bank of Canada).

These institutions make the Great Lakes economic region home to nearly 38 percent of all academic research and development performed at universities and colleges across Canada and the United States combined. Academic research and development as a share of total research and development performed in the region is nearly 19 percent, a share greater than that for the United States as a whole (14.4 percent), and for the United States and Canada combined (15.5 percent).¹⁷ As a metric of intensity, research and development performed at colleges and universities in the Great Lakes region accounts for 0.41 percent of the regional GDP, which is greater than the U.S. share (0.37 percent) and the combined share of Canada and the United States (0.39 percent).¹⁸

Working together, this public and private basic and applied research base contributes a significant share of both nations' new ideas and new intellectual property—cornerstones of productivity gains and new products and firms. For example, the Great Lakes states produce nearly a third of the nation's new intellectual property in the form of patents. In Canada, the total amount of the nation's new intellectual property contributed by the Great Lakes provinces has varied between 70 percent and 80 percent over the last decade.¹⁹ Moreover, the Canadian provinces of the Great Lakes region produce over a thousand academic publications each year, including publications by universities, affiliated private research institutions, and provincial governments. These make up over two-thirds of all Canadian academic publications.²⁰

Talent Generation

One of the most important contributors to innovation is talent—the creative, well-educated, and specialized human capital that creates new ideas and processes and puts them to work. The bi-national Great Lakes economic region has a solid platform on which to produce the talent both nations need to thrive economically—a direct legacy of the region's unique commitment to high-quality, low-cost education for all.

With 35 percent of the bi-national population, the region produces 41 percent of U.S. and Canadian university graduates. Among these graduates, well over 7,000 from the Great Lakes Canadian provinces received degrees in mathematics and computer and information sciences in 2004. Business management, and public administration degrees amounted to over 31,000, almost three-quarters of Canada's graduates in these fields. Moreover, the Great Lakes provinces produce almost 10,000 graduates in physical sciences, life sciences, and technologies annually, contributing immensely to bi-nations' fresh talent.²¹ Meanwhile, in 2003, 205,593 science and engineering degrees were awarded in the Great Lakes states, 48,537 of which were advanced science and engineering degrees. These degrees represent over 36 percent and 37 percent of U.S. totals, respectively, in these fields.²²

Beyond their role as talent magnets and producers, the universities of the Great Lakes function as truly global institutions, advancing intellectual discourse, new discovery, and cross-nation exchange of ideas and commerce. Today these institutions are engaged in substantial efforts on every continent. For example the University of Michigan has partnerships with Peking University and Shanghai Jiao Tong, business school campuses in Seoul, Hong Kong, Sao Paulo, Paris, and London, and runs an Institute for Emerging Economies in Eastern Europe. The University of Toronto operates global health technology outreach programs in India, China, Brazil and Africa, aiding these parts of the world to apply new health treatments and knowledge to local conditions.

These and other international linkages will help keep the Great Lakes at the forefront of new technologies and innovation on a global basis, while expanding important multi-national economic and cultural ties.

Growing Global Trade and Bi-National Gateway

With trade as a share of GDP growing from 10 percent of domestic GDP to nearly 30 percent today, Great Lakes states and provinces and their metropolitan areas are their respective countries' global trading hubs, shipping goods by rail, road, water, and polar air routes to destinations as distant and important as China. The Great Lakes states and provinces together account for nearly 39 percent of U.S.-Canadian trade with the world.

The Great Lakes region also plays a central role in Canada and the United States' economic relationship with each other, with over \$500 billion in two-way merchandise trade flowing between the region's states and provinces in 2005. Great Lakes states' exports to Canada in 2005 made up over 37 percent of all exports from the region to the world, for example, while their exports to the EU, the second largest recipient of U.S. goods and services, comprised just 22 percent. All told, the Great Lakes economic region accounts for 62.3 percent of the total Canada and United States two-way trade.

The estimated \$1.2 billion in trade crossing the U.S.-Canadian border daily is extremely concentrated, with a large portion flowing through just a handful of Great Lakes crossings. Approximately 28 percent, or \$113.3 billion, of surface trade passes annually between the United States and Canada at the Detroit-Windsor border, and another \$35 billion at the nearby Port Huron-Sarnia crossing. The busiest Great Lakes crossing is Buffalo-Niagara, where \$57 billion in goods passes through annually.

Exports from the Great Lakes Economic Region to the rest of the world make up nearly 40 percent of the total value of bi-national world exports

Trading Partner	GLER	Canada/U.S. Combined Total	GLER Share of Canada/U.S. Combined Total
(In Billions)			
World	\$492.3	\$1,264.4	38.9%
EU	\$63.5	\$207.9	30.5%
Mexico	\$23.1	\$122.8	18.8%
Japan	\$14.6	\$63.0	23.2%
China and Hong Kong	\$14.9	\$65.2	22.9%

Source: Authors' analysis using data collected from TradeStats Express, StatCan

The Great Lakes Economic Region is responsible for 62 percent of total bi-national trade dollars

	Bilateral Trade (US\$ Billions)	Percentage of Combined Total Canada/U.S. Bilateral Trade
Michigan	\$71.8	7.6%
New York	\$33.5	3.6%
Illinois	\$33.4	3.6%
Ohio	\$30.5	3.2%
Pennsylvania	\$17.7	1.9%
Indiana	\$14.9	1.6%
Minnesota	\$13.5	1.4%
Wisconsin	\$10.0	1.1%
Kentucky	\$8.8	0.9%
Missouri	\$7.1	0.8%
Iowa	\$5.9	0.6%
West Virginia	\$2.3	0.2%
Ontario	\$273.5	29.1%
Quebec	\$62.9	6.7%
GLER Total	\$585.8	62.3%
Canada	\$478.6	50.9%
United States	\$461.3	49.1%
Bi-national	\$939.9	100.0%

Source: Authors' analysis using data from Statistics Canada, U.S. Census, and The Canadian Embassy

* Total Bilateral Trade was calculated based on C\$709 Billion at a rate of US\$1=C\$1.2116

**All data from Statistics Canada and U.S. Census

The two-way trade that crosses the Ambassador Bridge between Michigan and Ontario equals all U.S. exports to Japan.

The Great Lakes region historically has been the leader in testing and developing the cross-border economic opportunity in North America—a relationship that provides considerable benefits to both countries. The ease by which goods have been able to cross the border allows Canadian and U.S. companies to implement highly efficient supply chain management processes, with many operating

“The largest challenge to further economic integration is posed by homeland security concerns and measures that have slowed border and bi-national economic exchange since 2001.”

just-in-time inventory systems. The implementation of these logistical processes has served to decrease the ratio of inventory to GDP in the United States from 25 percent to 15 percent in the twenty years, and has dramatically increased border traffic and exchange.

There are additional location advantages to exploiting this cross-border relationship, irrespective of which side of the border one is on: A company can locate in Canada to benefit from its social policies such as health care and low corporate income taxes,²³ while easily connecting to the American market or can enjoy access to U.S. financial, institutional, and regulatory regimes, with effortless access to the Canadian marketplace and academic talent.

The bi-national economy provides other synergies as well. Over 110,000 Canadians commute to work in U.S. cities every day, for example, including an estimated 5,000 needed nursing and health care workers in the Greater Detroit/Windsor area alone. Travelers, tourists, and commuters, too, flow daily across the border. Over 27 million passenger cars and 4.8 million noncommercial trucks used border crossings in 2006, benefiting the economies of both countries.²⁴ That year, Canadians visiting the United States spent \$10 billion, 80 percent of which supported dining, hotel stays, and gift purchases. Again, the Great Lakes state and provincial governments provide key entry points. The Great Lakes provinces have been receiving a maximum of 60 percent of all U.S. tourists to Canada in the last decade.²⁵ Meanwhile, in 2006, 29 percent of all U.S. visitors from the United States composed at least three quarters of all international tourists to the Great Lakes region, bringing in an estimate of \$27.5 billion CAD, and supporting further expansion of the region.²⁶

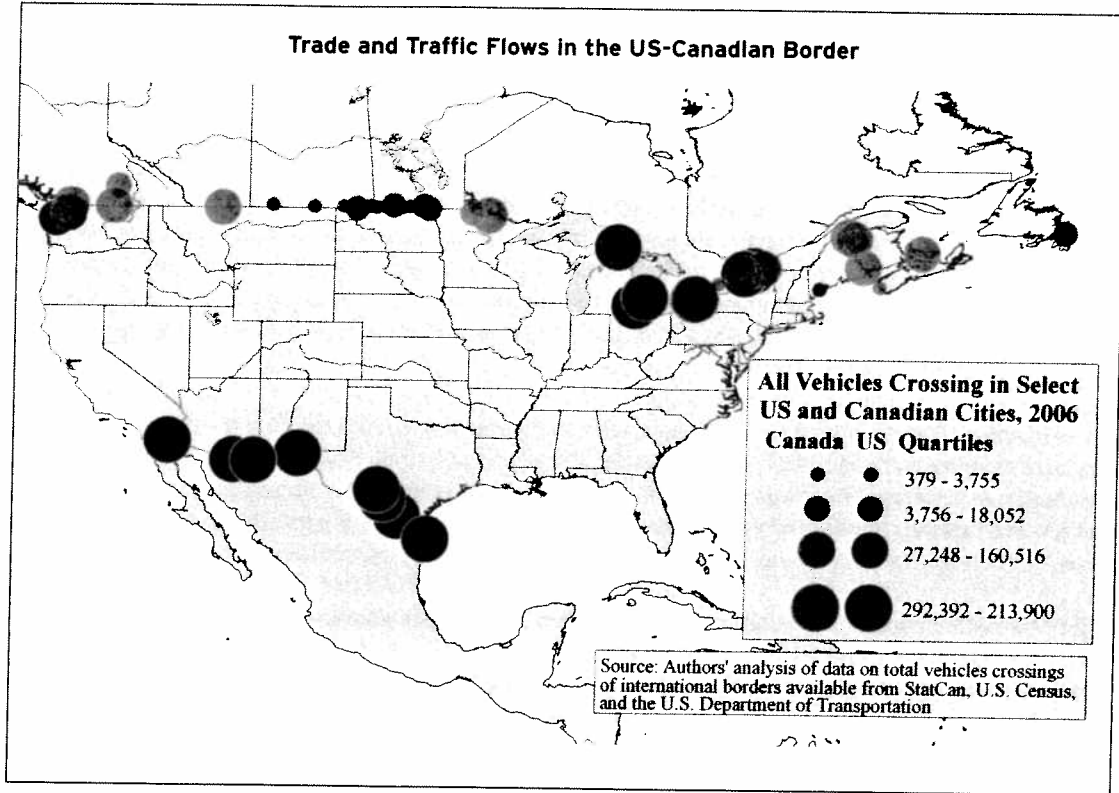
All these benefits are imperiled, however, by measures that add to the cost or time of crossing the borders between the United States and Canada, and negatively impact enterprise investment, and job growth across the region.

The largest challenge to further economic integration is posed by homeland security concerns and measures that have slowed border and bi-national economic exchange since 2001. The economic impact on the Great Lakes region of Homeland Security regimes has been disproportionate. New layers of security and more complex rules and regulations between 2000 and 2004 have tripled the processing time to enter the United States by truck. The costs of these efforts have been estimated at up to U.S. \$11.5 billion annually across both countries.²⁷

Total Canadians crossing to the United States show a 50 percent decline from historical rates due to real and perceived border crossing difficulties. Canadian tourism spending in the United States should have risen with the strong Canadian dollar, but total annual crossings in 2005 compared to 1995 show a 50 percent decline, due to real and perceived border crossing difficulties. In calendar year 2007, passenger vehicle crossings were

down 7 percent, or over 1.1 million vehicles.²⁸

Anecdotes and reports from the border suggest this is in part due to a more involved U.S. border screening process. Traffic is down at three of the four international bridges in the Niagara area, and wait times are up; processing time at the Peace Bridge, for example, increased 32 percent in August 2007 versus a year ago. Bridge travelers say inspectors are taking more time to clear travelers, and asking veteran border crossers new questions.²⁹ New requirements for proof of citizenship to enter the United States pose new uncertainties. These conditions threaten to crimp trade and commerce at a time when the region and both nations have tremendous shared stake in enhanced economic integration.



The Great Lakes region has critical mass in many of the traditional sectors (steel, aviation, oil, machining) for which it is most well known. But its prowess is also growing in newly emerging sectors such as information and communications technology, health and life-sciences, and energy.

Advanced Manufacturing

Although the number of manufacturing firms and jobs in the Great Lakes region has declined considerably over the past several decades, the sector is still a major driver of the economy. Thirteen percent of jobs in the bi-national region are in manufacturing, compared to less than 11 percent total in the United States. In fact, the region boasts 44 percent of the two countries' total combined manufacturing jobs, while its overall share of employment is just 37 percent.

If anything, the relative competitiveness of Great Lakes manufacturing has increased, as manufacturing generally has restructured. Part of the reason for this is because these advanced manufacturing jobs are in varied industries: The Twin Cities metro area accounts for 22 percent of national output in the biomedical devices industry, for example, while Detroit is responsible for 18 percent of motorcycle parts manufacturing output.³⁰ Even as the Big Three and auto industry undergo dramatic changes that continue to shrink factory employment, the region is still consolidating as a global auto design and research center. Honda, Toyota and other highly competitive firms are locating new facilities in the Midwest (Indiana, Ohio), and opening new major research and development centers in the Southeastern United States which will employ thousands of highly educated professionals. All told, auto-related industries are eight times more concentrated in the region than in the United States as a whole, and their supply chains are highly integrated across the US-Canadian border.³¹

The Great Lakes Economic Region has a disproportionately large share of bi-national manufacturing employment

Geography	Total Manufacturing Employment	Total Employment
	In Thousands	
Ontario	910.7	6,535.3
Quebec	551.1	3,677.7
Illinois	688.2	5,861.9
Indiana	571.1	2,955.2
Iowa	229.1	1,480.5
Kentucky	262.1	1,824.5
Michigan	676.7	4,390.3
Minnesota	347.2	2,723.3
Missouri	308.9	2,735.3
New York	580.9	8,533.3
Ohio	811.5	5,426.7
Pennsylvania	679.4	5,702.2
West Virginia	62.2	746.5
Wisconsin	504.9	2,842.1
GLER Total	7,184.0	55,434.9
Canada/U.S. Combined Total	16,196.0	150,161.5
GLER Share of Canada/U.S. Combined Total	44.4%	36.9%
Manufacturing as Share of Total GLER Employment		13.0%

Source: StatCan and U.S. Bureau of Labor Statistics

Note: U.S. data is not seasonally adjusted and total employment is total non-farm employment.

While manufacturing, including autos, is often thought of as an “old technology” industry, it is increasingly sophisticated in developing and using new technologies in their operations and products. Indeed, as we have seen, the Great Lakes region’s high concentration of manufacturing-reliant jobs include significant numbers of high-technology occupations and activities.

This experience base gives it a leg up on growing advanced manufacturing in emerging product lines, including robotics, electronics, health and medical devices and products (including ones that incorporate nanotechnology), energy producing and conserving materials and products, new sensing devices, and graphic and computer design and engineering applied to manufacturing processes. These examples don’t even consider the power of new transformative technologies that may create products and services not seen today; such technologies could offer the region comparative advantage that extends its high-value manufacturing in new directions.

Energy

Energy production and technology development and research across a range of technologies (bio-fuel, wind, hydrogen, fuel-cell, battery, clean-coal, nuclear) and related industries (such as transportation) is significant and diverse across the Great Lakes region. As energy ties and next generation energy technologies continue to be developed in the bi-national heartland, the opportunity to rely on the U.S.-Canadian “Middle West” versus the “Middle East” for energy can bring long-term economic and political benefits.

The United States and Canada already enjoy the largest energy trade relationship in the world. Canada is the single largest foreign supplier of energy to the United States, providing 17 percent of U.S. oil imports and supplying 85 percent of the country’s natural gas. The viability of Canada’s oil sands has raised Canada’s proven petroleum reserves to 175 billion barrels, making it the world’s second-largest holder of reserves after Saudi Arabia and the United States’ largest oil supplier. In addition, as one of the largest hydroelectric power generators in the world, Quebec supplies significant energy to both countries in this clean renewable form.

Driven by competitive and regulatory concerns, the region’s huge auto and related sectors are pushing hard for advances in battery, hybrid, alternative fuel, and other transportation-related technologies. While centered with the region’s automakers, this research and production base extends to Canada, which currently produces over 50 percent of fuel cell vehicles worldwide.

Research also suggests significant potential economic payoffs—as yet unrealized—for the Great Lakes region to be the leading generator of wind-power, and by extension both researcher and manufacturer of sophisticated technologies such as the components required in this and other renewable energy technologies. Precision wind turbines along with complex photovoltaics require the kind of advanced manufacturing capability at which the Great Lakes region excels, but which it has not leveraged due to tardy entry into renewable energy markets.³²

With strong and consistent winds, states like Michigan can be leaders in wind energy production and access, leading to huge reductions in reliance on fuel oil and coal, and thousands of jobs in construction and maintenance of wind installations, billions of dollars in investments in the state, and millions of dollars paid annually in lease payments to landowners.³³

Experts such as University of Michigan economist Barry Rabe suggest that states would benefit by agreement on a common regional set of Renewable Portfolio Standards (RPS), and by working across geopolitical boundaries to maximize potential benefits from renewable energies development and production.³⁴ Nine of the top 20 states to reap investment and job creation potential from passage of an RPS are in the Great Lakes Economic Region.³⁵

In a step towards realizing this opportunity, Midwestern Governors just signed an accord to establish U.S. regional goals around carbon emissions and common RPS for their states.³⁶ Similarly, Ontario Premier Dalton McGuinty’s own proposal aims to reduce greenhouse gas emissions six percent by 2014, 15 percent by 2020, and 80 percent by 2050.

Should this path be supported politically, the Great Lakes Region would also be in front in the research for nonpolluting, safe and secure nuclear power, as well as hydrogen-based power. The Great Lakes region has the largest concentration of nuclear power plants in the United States (primarily around Chicago), and the Bruce Power facility in Ontario is the largest nuclear power plant in North

“The research institutions of the region are positioned to move further into more sustainable technologies.”

America. The region's experience with this technology and very high temperatures available at advanced nuclear plants make them ideal for hydrogen production (whether through electrochemical processing).

Finally, with its abundance of bio-mass, and the huge concentration of agri-business and private research in agri-science, the region is already a leader in biofuel and synthetic fuel technology developments. Eighty-five percent of all ethanol production is in the Midwest and Great Plains. Moreover, the research institutions of the region are positioned to move further into more sustainable technologies. The University of Wisconsin and Michigan State University, for example, recently received a \$100 million dollar U.S. Department of Energy research grant for genetic research of organisms to be used for energy, potentially identifying more environment-friendly sources than corn and other bio-fuels used today.

Freshwater Research, Education, and Technology Development

A third area of unique economic opportunity in the Great Lakes region is in freshwater technology development. The nation and the world face mounting challenges concerning access to, and efficient use of, limited freshwater resources at the same time that growing awareness of global climate change is driving new attention to energy conservation, which relies in part on the efficient use of water for heating, cooling, and sanitation.

Given this context, the Great Lakes region has many assets and development opportunities. The region is the largest freshwater repository (and laboratory) on earth. The Laurentian Great Lakes alone contain one-fifth of the world's volume of surface freshwater and 90 percent of the U.S. volume, making it the single greatest freshwater resource on the planet. The Great Lakes region is already home to the largest concentrations of private firms in various ways in water management and clean water technology, and has a critical mass of both Canadian and American freshwater research centers, including the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Center, the International Institute for Fisheries Research, Windsor's Great Lakes Institute for Environmental Research, Wisconsin's Great Lakes Water Institute, the Canadian Center for Inland Waters and the Aquatic Research Institutes of Canada, among others. From this, many bio-technology research initiatives have begun to emerge, such as the Upper Lakes Environmental Research Network of Canada, and the bi-national Council of Great Lakes Researchers.

The demand for freshwater technology is a \$400 billion per year global business worth \$100 billion in the United States alone. More public works money is spent on water issues than on any other problem, and potential plans to invest in enhanced freshwater, treatment, and water infrastructures, including the proposed \$26 billion Great Lakes restoration effort and a budgeted \$40 million Canadian CAD Great Lakes Remedial Action Plan Program are under consideration by the two countries' respective national governments. A recent Brookings Institution report concluded that in the United States alone, follow-through on the Great Lakes Restoration plan will contribute over \$80 billion in quantifiable economic impact, and will spur new freshwater treatment technology development.³⁷ Advances in clean water technology and conservation linked to improved energy efficiency will be important not just to the Great Lakes region's economy, but to the nation and the world.

Health and Bio-Sciences

The Great Lakes region is also the location of significant leadership in biotechnology applied to medical and agricultural processes and products.

Great Lakes communities are some of the nation's major centers of medical research, teaching, and treatment, with a number of U.S. hospitals highly ranked nationally in multiple disciplines. Macleod has conducted a ranking of Canadian health care areas, which identified nine health care regions in Ontario and Quebec among the top 20 in Canada.³⁸ Ontario and Quebec provide a network and structure for providing medical care and medical research, and over half of Canada's medical schools (nine of 16) are located in the two provinces.

On both sides of the border these concentrations of hospitals and medical research institutions

vital anchors and economic engines—both attracting students and patients, and creating new products and services. Furthermore, government funding programs for research in the vital health industry, such as NIH funding, from which the Great Lakes states captured over \$7 billion in extramural awards,³⁹ and the Ontario Health Research Projects, bring valuable resources to the Great Lakes health and medical research industries.⁴⁰

In addition, the states and provinces of the region are their nations' breadbasket and feedlot, and their leading university and private farm and agriculture research centers are seeing an explosion of research and development around bio and animal engineering to produce new drugs, treatments, antibodies, and biologically-based materials. Detroit/Ann Arbor, Chicago, and St. Louis are among the top biotech research centers in the country, and Toronto and Montreal are both ranked as leading global bio-technology clusters.⁴¹ The Toronto region alone, with more than 700 firms, 140,000 employees and \$4 billion in annual revenue, makes up North America's fourth largest pharmaceutical and biotechnology cluster.

Information and Communications Technology (ICT)

Finally, the Great Lakes region is a pioneer in inventing and developing the hardware and software, IT scientists and engineers, and organizations and policies that support the high speed computing networks that have connected and reshaped the world.

The universities of the Great Lakes have led the development of this technology: the University of Minnesota developed the supercomputer, the University of Illinois introduced the browser (Netscape), the University of Michigan helped develop the backbone of the Internet, and the University of Indiana today manages the development of Internet2. And although the United States has experienced a downturn in ICT employment since the "dot com" bubble burst, the Great Lakes states continue to produce a significant number of natural science and engineering degrees. The Great Lakes states as a block averaged 8.9 natural science and engineering degrees per 1000 individuals as compared to the national average of 7.9.⁴²

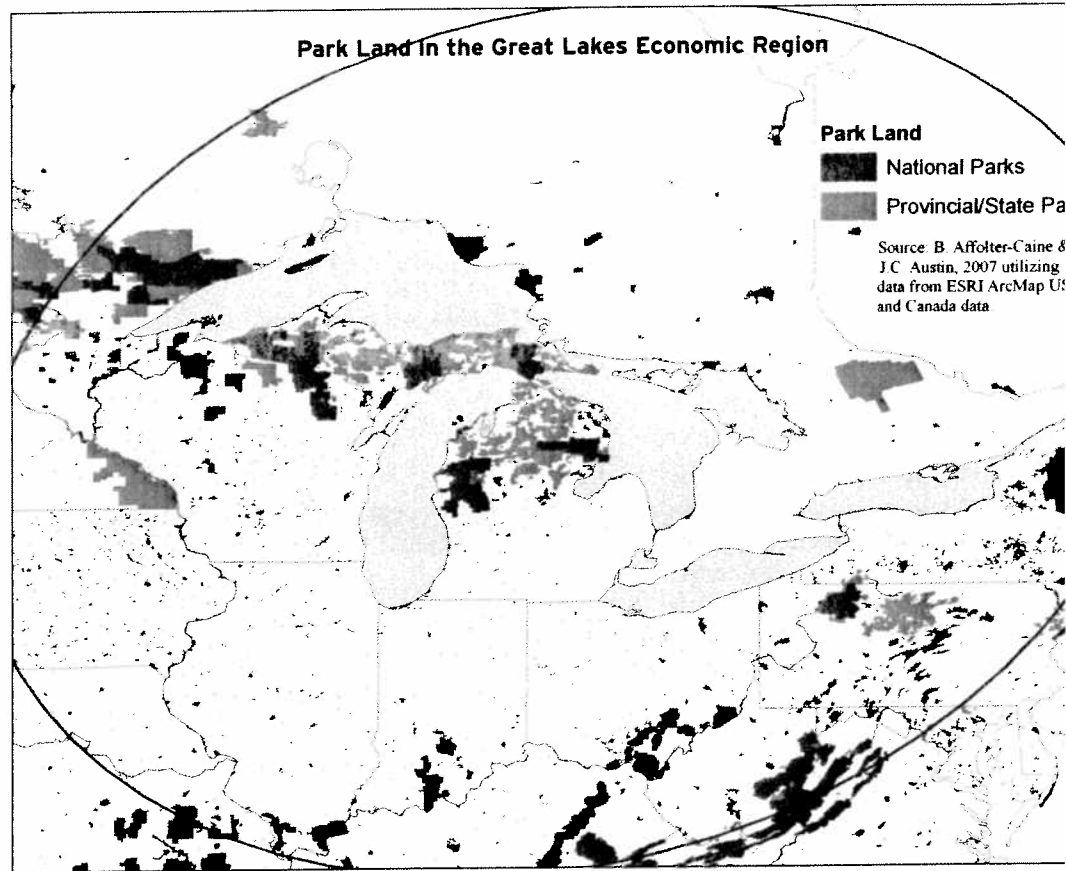
Canada, too, has made important contributions to the ICT revolution, with university graduates, researchers, and professors bringing ICT commercial products out from under the educational infrastructure. The most well known of these mavericks are Mike Lazaridis and Jim Balsillie, who founded Research in Motion and developed the much celebrated BlackBerry handheld communication device, and James Gosling, creator of the Java programming language and now a vice president at Sun Microsystems.

Unique Natural and Environmental Attributes

The Great Lakes region has unique natural and environmental attributes and features that both enhance the area's quality of life, and have the potential to support sustainable economic development. Given its abundant water, and the fact that it is largely immune to hurricane and other natural disasters, this "hazard free" third, or "freshwater" coast of the continent can support economic and population growth other parts of the continent and world cannot.

As significantly, people choose and prefer locations to live and work with scenic, environmental, and recreational amenities. The "magical quality" of water and other nature features are important factors in location desirability, and are a factor in the real choices people make for where to live, work, and locate a business.

The Great Lakes region includes large, unfragmented boreal forests in the north that gradually give way to deciduous forests and tallgrass prairies in the south. Thousands of inland lakes complement the five Great Lakes. Wetlands, marshes, bogs, and fens dot the landscape. There are over 10,000 miles of Great Lakes beaches and coastline alone, 30,000 islands to explore, and the Great Lakes shores harbor the largest collection of freshwater sand dunes on earth. One-fifth of all fish species in North America are found in the Great Lakes, which also contain an astonishing array of other plants and animals—46 species that are found nowhere else in the world, and 279 globally rare plants, animals, and natural communities. Hundreds of millions of birds migrate through and breed in the Great Lakes region. These natural wonders are made accessible for residents and visitors alike by a network of hundreds of state, local, provincial and national parks, and millions of acres of state, federal and privately owned forest land available to enjoy the outdoors.



The Great Lakes Nature Conservancy and the Nature Conservancy of Canada, in partnership with the Ontario Ministry of Natural Resources and other partners have identified the lands and waters unique and important to the ecosystem of the Great Lakes region. Their *Binational Conservation Blueprint for the Great Lakes* is a rigorous scientific inventory of native species, natural communities, and landscapes characteristic of the region. It identifies what areas need to be protected to ensure the long-term survival, including over 400 sites of significance for preservation.⁴³

Most cities and communities in the region are on lakes or riverfronts—both along the Great Lakes themselves as well as the thousands of miles of river systems linked to the Ohio, Mississippi, and Lawrence. These waters provide opportunity for attractive water-based development to emerge, replacing factories and mills with offices, shops, residences, and public access ways. As yet, however many of these areas are contaminated with industrial relics and waste, obscuring waterfronts and lakefronts that are or could be valuable locations for development. No complete U.S. and Canadian inventory of defunct industrial and/or brownfield sites exists, but respondents to a 1999 U.S. Conference of Mayors survey of cities identified 14,068 brownfield sites alone in the states of Illinois, Indiana, Missouri, Minnesota, Ohio, Pennsylvania, and New York, or over 66 percent of all the identified sites nationwide.⁴⁴

Rehabilitating these sites could open up new economic opportunities across the region, but states, provinces, and localities have been increasingly hard-pressed to deal with the large amount of resources it would require, while federal assistance has been lagging or diminishing.⁴⁵ A recent study by leading economists placed the economic value of a proposed \$26 billion Great Lakes ecosystem restoration effort—cleaning wetlands and polluted areas, rebuilding sewer and water systems, and protecting scenic areas and fish and wildlife venues—at over \$80 billion dollars in the form of enhanced property values, tourism and recreation, and new jobs and development.⁴⁶

V. Blueprint for Bi-National Great Lakes Economic Leadership

There are shared bi-national—and even global—interests at stake in leveraging the economic assets of the Great Lakes region discussed above. One only need look to the European Union to see the tangible and mutual economic benefits of knocking down barriers and creating efficient common markets out of national economies. As William Testa, senior economist at the Chicago Federal Reserve, observes: “The bi-national Great Lakes Economy stands as a prototype of what economic regions will increasingly look like in the global economy.”⁴⁷

To realize the latent economic opportunities of the region, both countries require more than the well-intentioned, slow-walk of the existing Security and Prosperity Partnership dialogues of the past three years.⁴⁸ The next U.S. president must join with his or her Canadian counterpart to punch through real and perceived barriers to bi-lateral policy innovation, and put the major elements in place that can fuel bi-national prosperity and transform the Great Lakes regional economy. Working together, the countries can pioneer effective and efficient ways to enhance economic exchange while both ensuring mutual security and respecting the unique cultures of each partner.

The recommendations offered here are organized around a limited set of ambitious goals, goals that would serve to prioritize and unify efforts, push through bureaucratic inertia, and truly realize the promise of the region:

- By 2010: Develop a Bi-National Innovation Fund and Strategy
- By 2010: Redevelop North America’s Freshwater Coast
- By 2015: Define and Implement the “U.S.-Canada Border of the Future”
- By 2025: Realize Bi-National Great Lakes Carbon Goals and Renewable Energy Standards
- By 2030: Create a Common Market for Commerce and Human Capital

By 2010: Develop a Bi-National Innovation Fund and Strategy

Federal policies on both sides of the border aimed at enhancing national competitiveness—through research and development spending, and incentives for the education of scientists, technologists, engineers, and mathematicians—would naturally funnel through the Great Lakes region, and support its transformation. In addition, the United States and Canada can accelerate needed technology development and talent generation by also explicitly investing in programs that support research and innovation in the Great Lakes region.

The Canadian Foundation for Innovation is a direct method for the Government of Canada to contribute to recent increases in national investment in research and innovation. The United States’ recently passed America Competes Act calls for an increase in the resources available for basic and applied research, and targets them in a more strategic manner. Additionally, the Brookings Institution and others are currently developing proposals to establish a U.S. National Innovation Foundation that would develop strategies to support innovation.⁴⁹ Among other functions, a National Innovation Foundation (NIF) would fund national-level sector-based research initiatives, and regional partnerships for research, development, and commercialization of new technologies.

The split of the Great Lakes economy between two countries has posed natural and understandable barriers to university and institutional communication and network-building, barriers worth breaking to harvest the economic benefits of shared research capacities.

Given the scale and quality of research and commercialization potential in the Great Lakes in a range of emerging fields, both governments should task their existing (in Canada) and potentially new (in the United States) National Innovation Foundations to develop a Bi-National Great Lakes fund and plan to identify tangible opportunities to nurture mutually beneficial bi-national networks, research, venture funding and development opportunities, which would serve to further and advance innovation across the Great Lakes region in key sectors.

A Bi-National Innovation Fund could be a mechanism to:

- Incentivize the creation of bi-national research consortia/collaboration among research universities and firms and facilitate network building and communication;
- Leverage investments by rewarding consortia that match federal investments in next generation technologies of priority with state, provincial, pension, investment and endowment funds;

- Identify and support sectors of national priority in which the Great Lakes region has expertise and a critical mass of public-private research horsepower, including:

Next-generation Energy Technologies. Such an effort can spend and maximize energy technology development through a network of energy Discovery Innovation Institutes (DII) in the region. A specific proposal for these market-sensitive energy research institutions centered around the leading research universities of the region, is being crafted by regional partners with Brookings Institution sponsorship and could be the focal point for federal energy technology policy on both sides of the border.

Freshwater research, management and technology policy. This would include ocean, Great Lakes, coastal and atmospheric science and research, which has international policy implications and in which the Great Lakes region can excel.

Other areas of national import and Great Lakes comparative advantage. These could include advanced manufacturing, materials science, homeland security, ICT, medical health and bio/life sciences.

- Link these investments and priorities with supporting policies in trade, education, workforce and talent development.⁵⁰

By 2010: Redevelop North America's Freshwater Coast

Today no region-wide mechanism exists for developing and coordinating investments in and promotion of the "freshwater coast." States, provinces, and localities all have parochial and unconnected economic development plans to capitalize on their waterfronts. Existing bi-national organizations charged with Great Lakes stewardship are either focused solely on water preservation or too hamstrung by their particular organizational history and politics to focus on region-wide water-based economic development. And governmental structures within each country and between the United States and Canada are not necessarily aligned to facilitate strong cross-boundary economic development planning and decision-making⁵¹

A comprehensive proposal to leverage the natural and environmental and historical amenities of the entire Great Lakes region could garner a critical mass of political support and provide needed scope and attention to these precious assets. But such a program requires a politically-charged enabling authority, a mandate, and resources to organize and create strong incentives for regional water-based economic development.

Create a Great Lakes Coast Development Authority

The U.S. president and Canadian prime minister, with the support of Congress and Parliament, should create a Great Lakes Coast Development Authority either by (a) repurposing an existing international Great Lakes-focused organization, or (b) creating a new authority charged with bi-national economic development planning, and with the disbursement of bi-national federal resources to support economic development. (The authority could also be the mechanism to fund and manage follow-through on a proposed and needed Great Lakes-St. Lawrence Restoration compact, and bring economic development planning together with border policy issues).

The major responsibilities of such an authority would be to design, implement, and promote an integrated bi-national economic development strategy for the Great Lakes "freshwater coast" including:

- Facilitating cross-state and provincial collaboration by state/provincial economic development, tourism, and cultural/historical agencies in the marketing and promotion of the "freshwater coast" and its waterways, forests, parks, historical sites, cultural institutions, and natural scenic assets
- Promoting in-state/province and cross-state/province policies to expand public access to the shoreline and to invest in the acquisition, maintenance, and enhancement of natural and recreational areas as key components of economic development;
- Planning support and resources for water-based reclamation (e.g. brownfield cleanup, water/sewer infrastructure, waterfront infrastructures (like ports, marinas, public access with private development) and related development strategies crossing state, provincial, and international boundaries)
- Supporting integrated public-private and philanthropic-sponsored land acquisition, economic development, natural and scenic environmental amenity development, and tourism;
- Facilitating bi-national economic development and business organizations/consortia to aid business

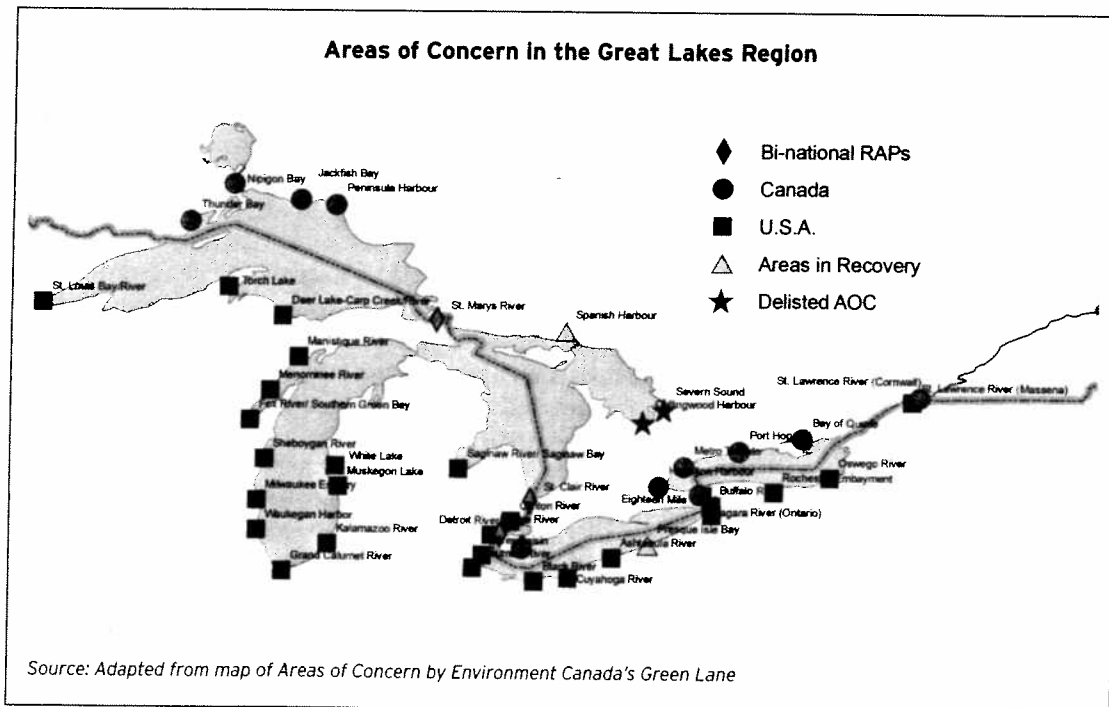
- Bringing together economic development planning interests in the region with border, homeland security, and transportation/infrastructure planning issues. The Authority should include an information arm—a Great Lakes Border Policy Institute—that could continually track and analyze data on the cross-border flow of goods, traffic, and people, and be a forum for informed policy debate, discussion, and policy development concerning trade and border management.⁵² The Authority could also oversee border transportation/infrastructure planning efforts called for elsewhere in this report.

Implement a bi-national Great Lakes–St. Lawrence Restoration Strategy

A second important ingredient in leveraging the economic power of the Great Lakes is Great Lakes-wide ecosystem protection and restoration. A science-based priority strategy for reversing trends of degradation and preserving the Great Lakes ecosystem has been articulated for the U.S. side of the region in the form of the Great Lakes Restoration Strategy—a joint effort among the U.S. federal, state, local, and tribal governments, private stakeholders, researchers, and scientists. Legislation enabling this restoration is currently sitting in Congress. The economic benefits of implementing this \$26 billion federal/state/local this strategy have been estimated as a three-fold payoff for the U.S. Great Lakes region. Similar investments on the Canadian side can pay complementary dividends.

But the Great Lakes are a shared water system, and effective priority protection demands a bi-national effort encompassing the entire water system through the St Lawrence. As such, the president and Canadian prime minister should join to support a Canadian restoration planning process, and join this effort with the U.S. Great Lakes Regional Collaboration to articulate a bi-national set of priorities for Great Lakes-St Lawrence restoration. These priorities should be based on strong consensus and scientific rationale, and should include specific recommendations for actions, investments, and projects that:

- Reduce non-point contaminant sources through protection of key wetlands and other buffer areas;
- Reduce toxic pollution from mercury, PCBs dioxins, etc.;
- Preserve important habitats and enhance conservation of unique places, bird, fish and wildlife habitats;



- Rebuild and enhance sewer and related infrastructure to reduce and eliminate sewage over and beach closings ;
- Afford comprehensive protection against invasive species;
- Preserve and reclaim valuable wetlands and ecosystems;
- Provide a clean up strategy for Areas of Concern (AOCs)—toxic hotspots that diminish the v. development or recreation of their locale as well as areas adjacent. Some of the biggest ecc dividends of Great Lakes Restoration strategy would flow from cleaning up these areas.⁵³

By 2015: Define and Implement the “U.S.-Canada Border of the Future”

The increased pressure to secure our common boundary offers a unique opportunity to rethink and often inefficient infrastructure, technology, and processes towards a border concept that m long term security and trade goals, and facilitates efficient movement of people, goods, and ser across the border. Such a vision is a key foundation of a revitalized Great Lakes Region. But the ation and implementation of a bi-national policy architecture under the umbrella of the “U.S.-Ca Border of the Future” will require strong, consistent political leadership, both to establish the vis and to push through technical, funding, operational, and bureaucratic impediments.

Develop and articulate a shared vision for the border of the future

The Great Lakes Region can serve as the “model” for secure and efficient borders. With this goa mind, the U.S. and Canadian governments should establish a “blue ribbon committee” compris high-level policy, business, and academic experts that articulates a multi-year strategic and op tional plan for our shared border. Under this plan the U.S. and Canada should by 2015:

- Achieve secure and unencumbered movements of people across the land, air, and sea borde using mutually recognized credentials, “registered traveler” programs, biometric technology assessment, and other state-of-the-art capabilities and processes designed to eliminate inef cies and improve security;
- Establish seamless border pre-clearance of U.S.-Canadian goods transported as part of a cor hensive North American customs clearance system or fully compatible national systems;
- Ensure stable funding sources for border improvements through a coordinated infrastrucur investment plan that drives investment on both sides of the border;
- Continue to push for state-of-the-art technology, operations, and processes to support Great Lakes and bi-national economic prosperity.

Invest in 21st century transportation infrastructure systems

Advances in policy and investments in infrastructures that both speed the progress of goods, pe and communication across the bi-national border, and provide needed security, will pay real and financial dividends to both countries, and particularly the Great Lakes region. However, these im plements *must* be linked to a more efficient transportation network.

The president and prime minister must charge an interagency federal task force to work with proposed Great Lakes Economic Development Authority to develop a comprehensive bi-national Lakes region transportation strategic plan. Such a strategy would focus on global gateways, inter modal hubs, and border crossings, with investments aimed at increasing security, adopting and integrating ITS, relieving bottlenecks, improving intermodal connections, and building new grade freight routes that reduce crossings and attract logistics centers that maximize productivity and reduce trip demand.⁵⁴ To this end, key transportation and infrastructure investments should inclu

- Expanded and functional border transportation infrastructure such as access roads, new and ing bridges, ferry terminals and operations, ports, mass transit connections, and rail lines;
- Ports of Entry facilities, such as jointly managed U.S.-Canadian border crossing facilities at k junctures of US-Canadian border;
- Improved intermodal connections and plans for enhancing key regional nodes of global trans and logistics;
- The development of public-privately financed bi-national high speed rail linkages between ke Great Lakes metros.

By 2025: Set and Realize Bi-National Great Lakes Carbon Goals and Renewable Energy Standards

Both nations, including the Great Lakes region, stand to benefit from national articulation of carbon goals and Renewable Energy Portfolio standards; it is in the economic interests of the Great Lakes region to meet and or exceed these standards by date certain.

Implementing such standards would serve to protect the globally unique freshwater resource of the Great Lakes, reduce national pollution emanating from the region, and enhance natural resource/environment based-business. But it would also spur the region to build new green and sustainable technologies, products, and services that will create new markets and new jobs. Other regions, notably the Northeast and West Coast, are jumping ahead to become national and international leaders in the field—but the Great Lakes region has an unprecedented opportunity to build on the strong bones of its manufacturing, chemical, transportation, energy, construction, and related industries, and compete in the green innovation race.

The challenges associated with global climate change provide another compelling reason for the region to move quickly and persuasively to nurture new energy technology industries. In fact, global climate change has become an imperative for a region seeking to leverage its coastal assets. A recent report on climate change and the Great Lakes from the National Wildlife Federation suggests that average lower lake levels associated with continued warmer temperatures could seriously undercut the Great Lakes region future economy, predicated as it is on access to the Great Lakes.⁵⁵

To establish their leadership in new energy technologies and global warming remediation, the Great Lakes states and provinces should:

- Extend the agreement begun by the Midwest Governors to the provinces of Quebec and Ontario, joining together to develop 25 percent of electrical power and 25 percent of transportation fuel from renewable energy sources by 2025.
- Articulate and develop clear regional standards and support a bi-national cap and trade system for carbon dioxide and other greenhouse gases. The sluggish Great Lakes economy has meant reduced outputs since 1990 in comparison to most other parts of the nation. Under a cap and trade system, states could sell their surplus carbon credits, which if put into energy technology research and development, infrastructure improvements, and education could further fuel the transformation of the region.⁵⁶

By 2030: Establish a Common Market for Commerce and Human Capital

In order to realize the tremendous economic benefits of frictionless movements of ideas, people, goods, and services, the federal governments of both the United States and Canada need to develop a next generation NAFTA-type agreement that forges more comprehensive, mutually beneficial economic relationships, while attending better to the human dislocations that can result from economic change. This can be accomplished by accelerating and elevating the priority of current discussions concerning goods and services regulatory harmonization, and focusing new agreements on the most valuable economic resources of the region—the region's human capital. Such agreements should help the region to both grow its workers' talents and skills and to increase the ability to provide them with flexibility and security in their persons, health care, and pensions.

Finish commerce and regulatory harmonization

There is no obstacle to continuing and dramatically accelerating progress on standards, financial market harmonization, and areas of regulatory cooperation that are currently on the table and being advanced, albeit slowly, in the three way Security and Prosperity Partnership (SPP) discussion. It might in fact accelerate progress on a comprehensive North American agreement to advance bilateral agreements between the United States and Canada in priority areas of:

- consistent application of standards and regulatory requirements, including in food labeling;
- harmonization of standards with international technical standards;
- better cooperation in financial regulation, and treatment of financial transactions such as interest payments;
- a coordinated Intellectual Property Rights (IPR) strategy, including steps to combat DVD piracy and consumer goods counterfeiting.

Develop a Common Market for Human Capital

Improving the economic competitiveness of the bi-national Great Lakes region demands that people and their skills, and credentials be able to move more seamlessly across borders.

A Common Market for Commerce and Human Capital, pioneered in the U.S.-Canadian Great Lakes region, would create a world-envied dynamic and flexible marketplace for education and labor mobility; acknowledge and support the highly interconnected reality of the region's firms, supply chains, and employment opportunities; and capitalize on the region as a world center for "high quality, low-cost" education and lifelong learning. All would contribute to greater individual opportunity, flexibility and adaptability, and economic productivity in the region.

Key elements of such a Common Market—all scaleable elements of existing federal, state/provincial and/or firm/institutional policies—should include:

- In-region comparable tuition compacts and portability of learning credits among higher education institutions, as well as bi-national and state/provincial acceptance and portability of postsecondary degrees, credentials, and professional licensure;
- Portability of existing pension plans among firms and governments; and state/provincial policies that make pension plans available for all individuals and small business employees to join;
- Portable health care coverage guaranteed through a state/provincial regional health care program through employer/union programs. Providing supportive bi-national tax and other policy treatment to support emerging Voluntary Employee Benefit Associations (VEBA) models within large-scale legacy industries can aid in their adoption and success;
- A bi-national "GI Bill-like" Postsecondary Education package of easily identified, easily accessible resources available to all adult learners/workers that is expandable across state/provincial and country lines; such a package will help all learners achieve necessary credentials with flexibility and portability of opportunity.

VII. Conclusion

The bi-national Great Lakes region can continue to model what economic regions will look like in the global economy—and also how they can thrive. To realize this vision will require leadership and purposeful actions that acknowledge the unique opportunities provided by the Great Lakes economy.

The first step toward this leadership is an awareness of the economic realities in the region, and what is at stake. Canadians are more aware of the size and significance of the economic relationship with the United States—both out of concern that this interconnected economy can dominate or crush unique Canadian culture and concerns, and in recognition of the fact that economic interdependence is vital to their economy.

American citizens are less aware, which leads to benign neglect in terms of policy and opportunity. Within the United States, the leaders and citizens of the Great Lakes region have substantial economic stake in enhancing a broader bi-national economic understanding, and in public policy that supports a stronger relationship. As such, Great Lakes leaders need to elevate in national discourse the special nature of the relationship, and the economic opportunities that exist as a result of it.

Fear that movement toward EU-style integration in North America—begun with the SPP—will crush sovereignty must be countered by appreciation of the economic, security, and quality of life benefits of close collaboration between people and populations disposed to rightfully trust each other. But this articulation has to come from the top. Only the U.S. president and Congress, along with the Canadian prime minister and Parliament, can promote understanding of the economic opportunities to be realized.

Working together, and working with federal leadership, the opportunity is real for the Great Lakes region to forge a new economic leadership position, and serve anew as a model for world economic and social innovation.

Endnotes

1. The Great Lakes Economic Region is defined as comprising all or part of 12 U.S. states (OH, IN, MI, PA, IL, WI, MN, IA, MO, NY, WV and KY) and most of the Ontario and Quebec provinces of Canada.
2. The Great Lakes Economic Initiative is a part of the Metropolitan Policy Program's *Blueprint for American Prosperity* initiative, working closely with political, civic, and nonprofit leaders from states in the Great Lakes region to articulate a federal policy agenda that responds to the assets and opportunities facing these two very different regions. Go to www.blueprintprosperity.org for more information.
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12. Due to complications standardizing GDP between Canada and the U.S., the mean percentage of R&D as a share of state/province GDP is used to calculate the comparison figure for the Great Lakes Region.
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16. Institute of Higher Education, Shanghai Jiao Tong University, 2005, available at www.arwu.org/rank/2005/ARWU2005_Top100.htm (March 24, 2007).
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 34. Barry G. Rabe, "Race to the Top: The Expanding Role of U.S. State Renewable Portfolio Standards" Pew Center on Global Climate Change (Arlington, VA: Pew Center on Global Climate Change, 2006).
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 52. *Ibid.* The Roundtable also found that the Great Lakes bi-national region, in contrast to other significant bi-national regions (such as British Columbia-Washington State) has no overarching cross-border organization to provide leadership and also has much less sense of a particular regional identity. This sense of identity and leadership may have allowed the West Coast to focus on specific, important bi-national policy issues, which has led them to be leaders in addressing border issues such as NEXUS travel and secure drivers license programs.
 53. Currently there are 10 Areas of Concern in Canada, 26 Areas of Concern in the United States, and five additional Areas of Concern shared by both countries.

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