



Opportunities abound
Women in engineering and design



The Air Rail Link
Taking city transit to another level

MEDIA PLANET

March 2012

ENGINEERING & INFRASTRUCTURE



WAYS

ENGINEERS ARE IMPACTING CANADA'S FUTURE



INNOVATIONS IN CONSERVATION AND DEMAND MANAGEMENT

A look at the smart and renewable energy sources behind the **accelerated innovation of electric vehicles**

PHOTO: RVTR



Shaping the Future
Working Sustainably



- Project Management
- Environmental
- Energy
- Geotechnical
- Water Resources
- Municipal Services
- Industrial Services
- Infrastructure
- Site Development/ Planning Services
- Transportation
- Mining



AMEC is a focused supplier of construction, engineering and project management services to its customers in the world's oil and gas, minerals and metals, clean energy, environment and infrastructure markets. With annual revenues of \$5 billion, AMEC designs, delivers and maintains strategic and complex assets and employs more than 27,000 people in 40 countries worldwide.

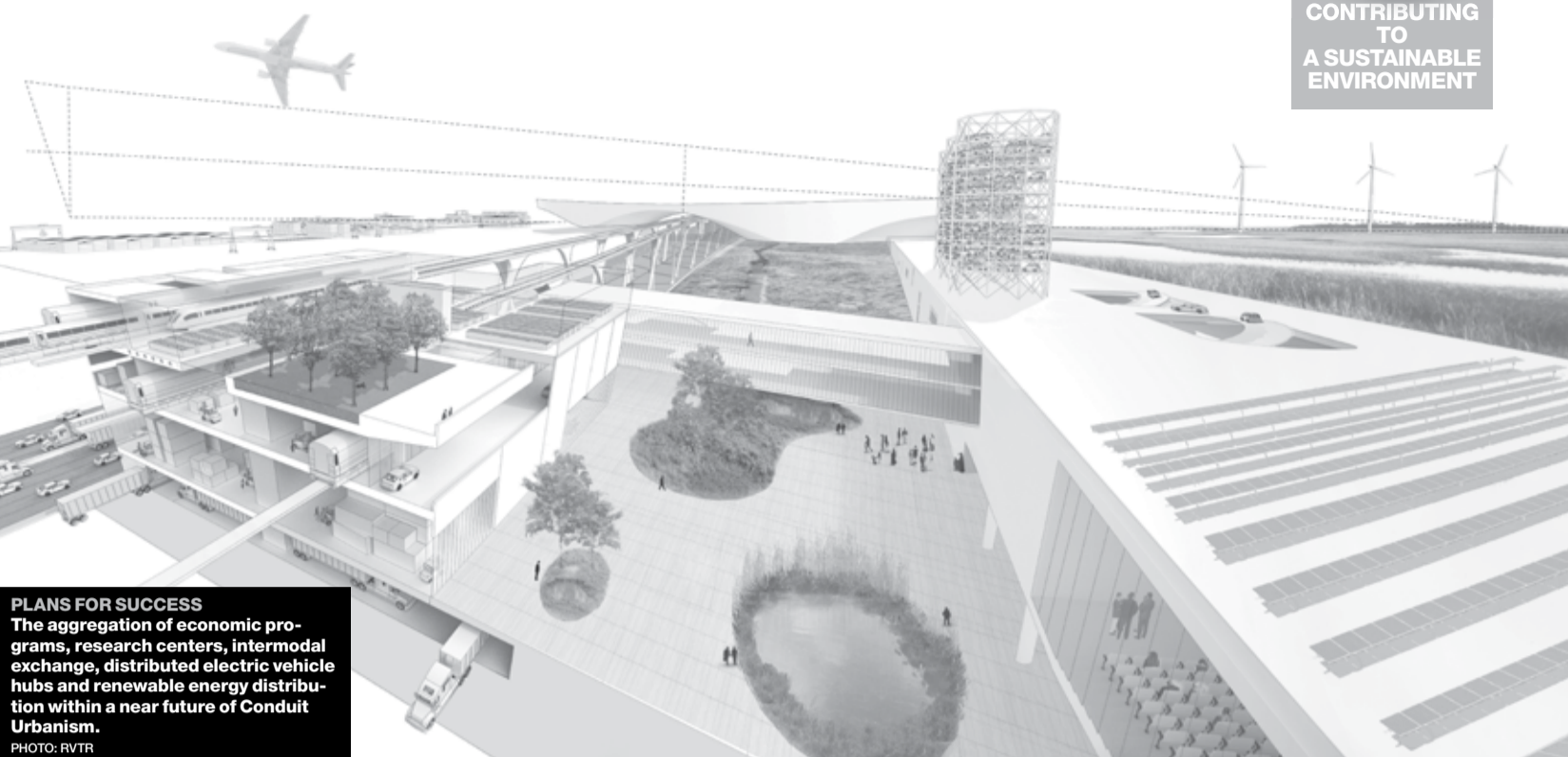
amec.com

CHALLENGES

INITIATIVE

1

CONTRIBUTING TO A SUSTAINABLE ENVIRONMENT



PLANS FOR SUCCESS
The aggregation of economic programs, research centers, intermodal exchange, distributed electric vehicle hubs and renewable energy distribution within a near future of Conduit Urbanism.
PHOTO: RVTR

With the commencement of National Engineering Month, the profession focuses on fostering the next generation of ingenuity and ensuring sustainable solutions for cities nation-wide.

Sustainable development is high on the agenda

One of the challenges we have as a profession is getting people to understand that engineers do so much more than simply build things. Whether they realize it or not, Canadians benefit from the work engineers do every day.

Confronting climate change

Engineers employ sustainable approaches to all aspects of our work. We apply engineering principles to improve air, water and land resources, and must carefully consider weather conditions that affect safety and longevity as we adapt existing and future public infrastructure to the potential effects of a changing climate.

This is why Engineers Canada and its partners established the Public Infrastructure Engineering Vulnerability Committee in August 2005. The Committee has been assessing the vulnerability of Canada's buildings, roads and associated structures, storm water and wastewater systems, and water resources to the impacts of climate change. The goal is to contribute to a review of amendments to design, operation and maintenance codes, standards and practices. The view is toward sustainability as the

norm rather than the exception.

Creating sustainable communities

On top of adapting infrastructure to the effects of climate change, engineers are a key part of the team responsible for infrastructure design and construction. Environmental engineer and councillor for the City of Waterloo Diane Freeman, FEC, P.Eng., believes that engineers are the ones who will drive change in terms of rethinking community planning: "Engineers have the tools to be leaders in building sustainable communities. They are able to think technically to envision how to change, and are able to implement these changes."

Councillor Freeman supported the redevelopment of Davenport Road in Waterloo, Ontario, one excellent example of sustainable thinking that benefits the whole community. The road was put on what is known as a "road diet," changing lane configurations and adding traffic calming measures to make the busy commuter road safer and more accessible and minimizing maintenance.

Future engineers: National Engineering Month

To ensure a strong engineering profession in the decades to come, Engineers

"On top of adapting infrastructure to the effects of climate change, engineers are a key part of the team responsible for infrastructure design."



Brent Smith, FEC, P.Eng.
President, Engineers Canada

Canada is proud to support National Engineering Month, an annual celebration of Canadian engineering excellence that promotes engineering as a career choice to youth.

National Engineering Month is organized by the profession's 12 provincial and territorial regulatory bodies, teachers, faculties, volunteers and university students, with events taking place in March. Design competitions, engineering fairs and other activities teach young Canadians how to use science, technology, engineering and math to generate things that were once only part of their imagination. Today's students are tomorrow's sustainable community leaders.

Engineers Canada is proud of the profession's contributions to creating better communities, a strong future, and a more sustainable Canada.

Engineers Canada is the national organization of the 12 provincial and territorial associations that regulate the practice of engineering in Canada and license the country's more than 250,000 members of the engineering profession. Visit engineerscanada.ca for more information on the Public Infrastructure Engineering Vulnerability Committee. Visit nem-mng.ca for more information about National Engineering Month activities and how you can participate.

Gaining priceless experience

Graduating from university with a degree is a vital investment in one's future, but the University of Toronto offers one of the most comprehensive work placement programs in all of Canada.

The Professional Experience Year (PEY) program has been operating since 1979, and it offers students a 12 to 16-month paid internship within their field of study, usually between their third and fourth year. The PEY has its own application process, and is open to Canadian citizens, landed immigrants and international students.

"The criteria for any job coming in is that if it's not going to produce a return on investment, or else we're not interested because 12 to 16 months is a long time," says Jose Pereira, director of U of T's Engineering Career Centre and PEY. "As a student, the objective behind the program isn't to find your dream job in your placement, it's to find a challenge that's going to add to your portfolio, so that after several

of these challenges, you're closer to that dream position."

Accessing big opportunity

Pereira says that about 720 students — 583 of which come from the university's engineering programs — are placed through PEY in 225 to 250 participating companies annually. These companies include AMD, IBM, Microsoft, Scotia Capital and Environment Canada, among many others. Placements vary from all over Canada, the United States and a small number overseas in countries like Spain, China and Japan. The average salary for PEY students in 2011 was \$44,000, according to Pereira.

Indy Chakraborty manages government relations and regulatory affairs at AMD, and has personally overseen the placement and integration of PEY students at the company. He says that out of the 71 new graduates AMD hired in 2011 at its Markham, ON facility, 40 were former PEY students.

"They're neither seen nor treated as 'students', they're treated as engineers working on projects that any



other full-timer would work on," says Chakraborty. "Our PEY interns get first-hand experience working with industry experts on cutting-edge technologies that gives them a tremendous head start upon entering the workforce at the completion of their degrees."

Chakraborty adds that AMD uses special orientation programs to get PEY students to socially interact with each other, but the main focus is to integrate them all into the company's

culture.

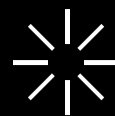
Pereira says the program's success will be directed towards the international scene. "We're currently working on placements with companies that can facilitate '6 & 6', which would be six months here with a company that also has operations in another country like Mexico, China or Europe for the other six months."

TED KRITSONIS

editorial@mediaplanet.com

JACK DIAMOND

editorial@mediaplanet.com



WE RECOMMEND

Electric vehicles
Implementing the car of the future within the infrastructure of today.

PAGE 4

"What's interesting about electric vehicles is that they are both an incredible opportunity for the grid and an incredible risk."

Conduit urbanism p. 5
How Canada's linear infrastructure can be of benefit.

Panel of Experts p. 6
Exploring the model behind successful infrastructure delivery.

MEDIA PLANET

ENGINEERING & INFRASTRUCTURE
2ND EDITION, MARCH 2012

Responsible for this issue:

Publisher: Clayton Hartford

clayton.hartford@mediaplanet.com

Designer: Penelope Graham

penelope.graham@mediaplanet.com

Contributors: Stephen Bauld, Amanda

Couch, Jack Diamond, Jim Dougan, Ted

Kritsonis, Brad McLellan, Mark Romoff,

Brent Smith, Nick Stark, Geoffrey Geoffrey

Thün

Photo Credit: All images are from

iStock.com unless otherwise accredited.

Managing Director: Gustav Aspegren

gustav.aspegren@mediaplanet.com

Business Developer: Cahill Puiil

cahill.puiil@mediaplanet.com

Distributed within:

National Post, March 2012

This section was created by Mediaplanet and

did not involve the National Post or its

Editorial Departments.



FOLLOW US ON FACEBOOK AND

TWITTER!

www.facebook.com/MediaplanetCA

www.twitter.com/MediaplanetCA

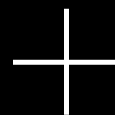
Mediaplanet's business is to create new cus-

tomers for our advertisers by providing read-

ers with high quality editorial content

that motivates them to act.

DON'T MISS!



Jack Diamond
Principal,
Diamond Schmitt
Architects

The need for social responsibility

■ In a world that is consuming its resources faster than they are being replenished there is a professional obligation to reduce their consumption as much as possible. As the construction industry is one of the largest consumers of material and energy, the aim of design should be economy. Indeed, if nature is taken as an example, economy of means results in the greatest elegance of form.



Bridgepoint Hospital Redevelopment
Toronto, Ontario



Ottawa Convention Centre
Ottawa, Ontario

Delivering P3 construction excellence.

At PCL we aspire to be the most respected builder, by delivering superior service and unsurpassed value to our customers. With more than \$7.5 billion in P3 projects currently underway or completed, PCL is one of the largest and most experienced P3 contractors in North America.



CONSTRUCTION LEADERS



Watch us build at PCL.com



A great place to work

When you're looking for a career move, you want to work with a company that values your skills, rewards your efforts, and gives you a unique opportunity to deliver great projects.

That company is Hatch.

We are over 11,000 strong in 65 offices around the world — an employee-owned engineering, project and construction management services firm leading some of the world's most exciting projects in mining and metals, energy, and infrastructure.

And we're growing.

If you're up for a great career, visit us at www.hatch.ca/careers.

We're engineers. We're consultants. We're project and construction managers.

And together we're writing the next chapter in Hatch's history of excellence.



CONSULTING • EPCM SERVICES
TECHNOLOGIES • OPERATIONAL SERVICES



Did you know?

Our 'Firsts' include...

First LEED® Gold digital healthcare facility in Canada to use 100% outside air – Royal Jubilee Hospital Patient Care Centre

Canada's first "skyscraper" – The Toronto Dominion Tower

North America's largest P3 healthcare project to date – Centre Hospitalier de l'Université de Montréal

Canada's first sports stadium with a fully retractable motorized roof – Toronto's Rogers Centre, formerly SkyDome

World's first high-speed moving sidewalk – Lester B. Pearson International Airport

First LEED® registered healthcare facility in Ontario – North Bay Regional Healthcare Centre

For more, visit www.hhangus.com/about/angus-firsts

HH Angus and Associates Limited Consulting Engineers

hhangus.com 416 443 8200

Toronto | Calgary | Montréal | Vancouver | Chicago | Dallas | Phoenix

INSPIRATION

Electric vehicles are hailed as a game changer for transportation and the environment. **However, utilizing the car of the future with today's infrastructure presents significant challenges.**

Integrating EVs into the smart grid of the future

HOW WE MADE IT

The promise of electric cars is that they could make a lasting impact on the environment, but once they reach critical mass, there remains uncertainty over how millions of electric cars could affect the power grid in the future.

Electric and hybrid vehicles are still in an early adopter phase, and their merits in reducing greenhouse gases have been widely reported. Matthew Stevens, principal at CrossChasm Technologies, a Waterloo, ON-based firm that works with the automakers and fleet operators, suggests that the biggest impact could be on the grid.

"What's interesting about electric vehicles is that they are both an incredible opportunity for the grid and an incredible risk," says Stevens. "Electric vehicles, by and large, are charged at night, and they won't need the entire time they're plugged in to draw power. The risk is in trying to charge them quickly. A Quick Charge,

which is a 50-kilowatt load for 20 minutes, is equivalent to a small subdivision's consumption."

Zapping the resources

Assuming that 1,000 cars were Quick Charging at the same time, it would amount to 50 megawatts, an enormous strain on top of existing demand on the grid, he adds.

Electric vehicles can be charged in three different ways. Level 1 is a standard 1.5-kilowatt 110-volt plug common everywhere, taking up to 12 hours to fully charge a Chevrolet Volt's battery, for example. Level 2 is a unique 3.5-kilowatt plug that would require Electric Vehicle Supply Equipment (EVSE) be installed in a home or garage first. That uses a home's basic 220-volt line, equal to four simultaneous hair dryers, cutting charging time down to three hours.

Handling hydro needs

It's the Level 3, or Quick Charge option, that is most disconcerting because of how taxing it is. Moreover, a consumer who actually had one at home would



"What's interesting about electric vehicles is that they are both an incredible opportunity for the grid and an incredible risk."

Matthew Stevens
Principal, CrossChasm Technologies

be hit with a monstrous hydro bill. For the moment, Stevens says, the first two levels are the only ones that make any sense for homes, especially when the cost is reasonable.

"A Volt has a battery capacity just under 11 kilowatt hours, and assuming you fill that up from empty every single night in a month, do the math and you would see it's considerably cheaper than what gasoline costs these days," he says.

As an example, 40 electric cars plugged in for 12 hours at night on one street, all using Level 2 EVSE chargers, only need four hours each to charge, he explains. The utility could stagger

them so that only 13 are charging at once, thus helping take pressure off the grid.

"The question is whether the utility company needs to know a Level 2 EVSE has been installed because of its potential impact on the grid at night, or if they even own that plug," he says.

Addressing existing infrastructure

Stevens points this out as one of the issues the industry is looking to address, particularly since so few homes currently have EVSE plugs installed. But he notes that the distribution of electricity for the

vehicles leads to another "massive debate" on who will actually have the ability to sell the power to consumers in the first place.

Hydro utilities in Canada are typically regulated geographic monopolies. Selling electricity requires a retailer's license and permission to charge a certain rate. If gas stations are to ultimately convert to power stations, they would need to apply as electricity retailers, unless the government opts to mandate utilities as the sole providers.

"The utilities would deploy where it's best for the grid, while private companies would deploy where it's best for their bottom line," he says. "Quick Charge stations would have the biggest impact on the grid, so it makes sense that utilities deploy them where they're best for the local grid. Third-parties would put them wherever the market wants them, but where it's best for the market may not be best for the grid."

TED KRITSONIS
editorial@mediaplanet.com



Winnie Ye

Carleton University graduate, BEng/00, PhD/07
Assistant Professor, Department of Electronics
Canada Research Chair in Nano-scale IC Design
for Reliable Opto-Electronics and Sensors

WINNIE YE IS DEVELOPING NANO-SIZED SOLUTIONS TO REALLY BIG PROBLEMS

Using silicon chips and photonics to detect and treat infectious diseases, Dr. Ye is developing the health and medical technologies of tomorrow at Carleton University.

She makes Carleton her research home for some of the same reasons that engineering and design students do: the university's partnerships with neighbouring technology companies and government institutions committed to advancing R&D, and one of the only campus microfabrication clean rooms in Canada. That means students get first-hand experience fabricating semiconductor devices for biomedical, telecommunications and renewable energy applications.

Carleton's Faculty of Engineering and Design offers rigorous programs of study in engineering, architecture, industrial design and information technology.

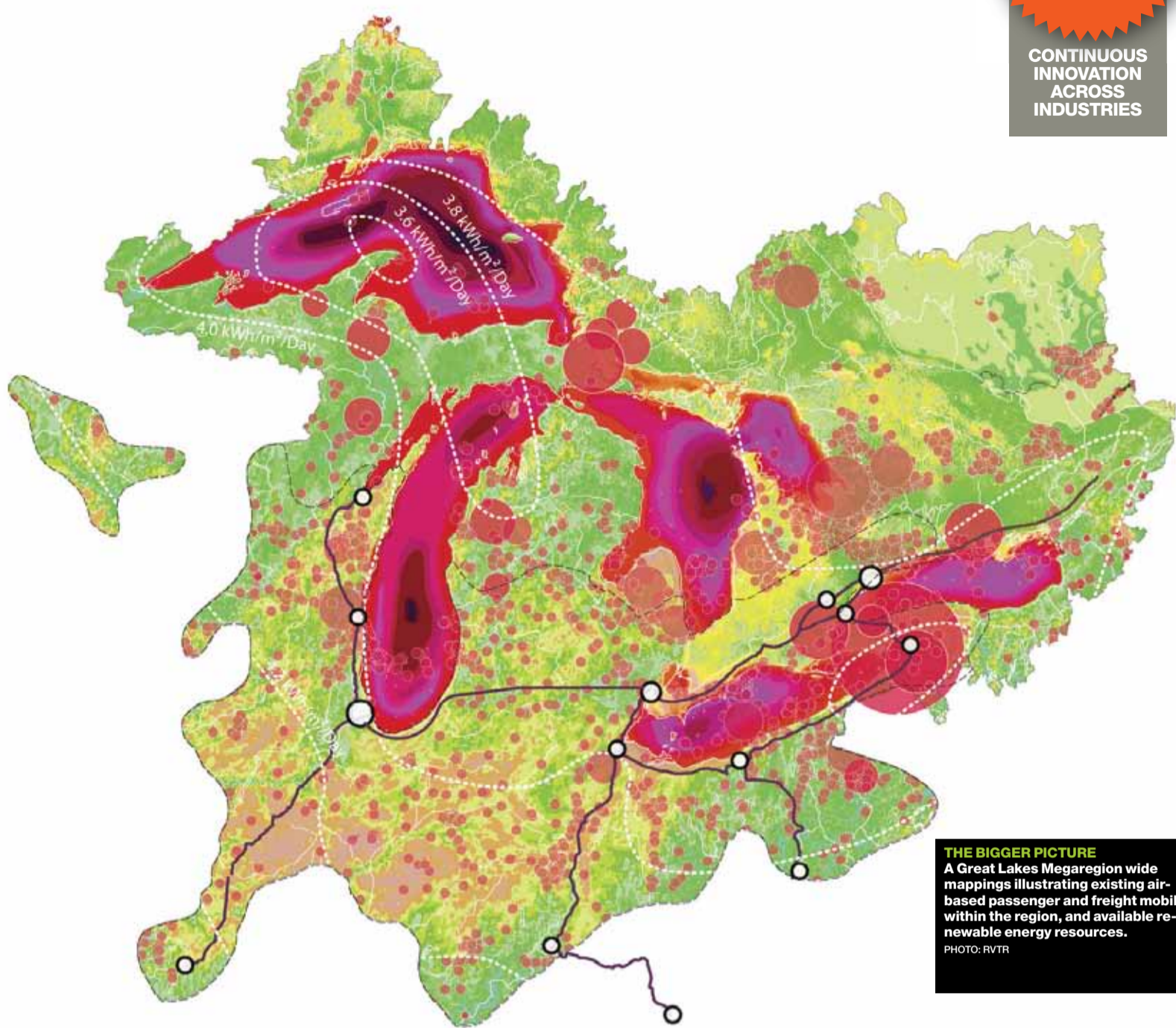
Discover more at carleton.ca/engineering-design



Carleton
UNIVERSITY

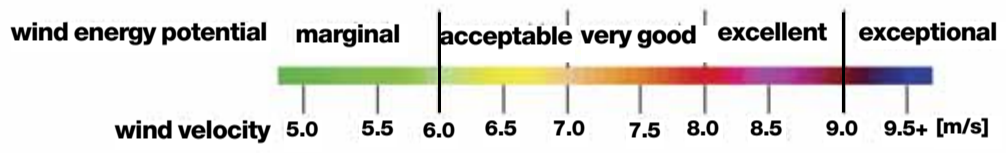
Faculty of
**Engineering
and Design**

INITIATIVE
2
CONTINUOUS INNOVATION ACROSS INDUSTRIES



THE BIGGER PICTURE
A Great Lakes Megaregion wide mappings illustrating existing air-based passenger and freight mobility within the region, and available renewable energy resources.
PHOTO: RVTR

--- megaregion
- - - - solar potential
— power distribution network



NEWS IN BRIEF

What is conduit urbanism?

Toronto firm RVTR Inc. has been rethinking the relationships between renewable energy, mobility and urban growth in the Great Lakes megaregion.

The work is situated in a near future scenario where increasing densification in Ontario has been mandated to occur alongside Hwy. 401— one of the busiest roadways in North America with over 420,000 vehicles per day moving across the northern edge of Toronto.

In contrast to the highly networked interstate system of the USA, Canadian mobility is limited to movements along a single line. What if this was seen not as a liability but as an asset? By combining a new infrastructural system consisting of elevated grid-tied MagLev trains, high voltage transmission for a regional portfolio of wind, solar and biomass based electricity, waste and water distribution with the space of the existing highway, they propose to radically refigure the shape of urban growth in Ontario. Rather than constituting a crisis, the 401 conduit may constitute a lever for sustainable energy infrastructure. In this light, sites of mobility, renewable energy, and last-mile electrical car rental collaborate to reshape concentrations of human settlement along the line.

GEOFFREY THÜN

editorial@mediaplanet.com

Read more on the web:
www.rvtr.com

A LEADING GLOBAL FIRM OF COMMUNITY-MINDED PEOPLE WHO MAKE A DIFFERENCE

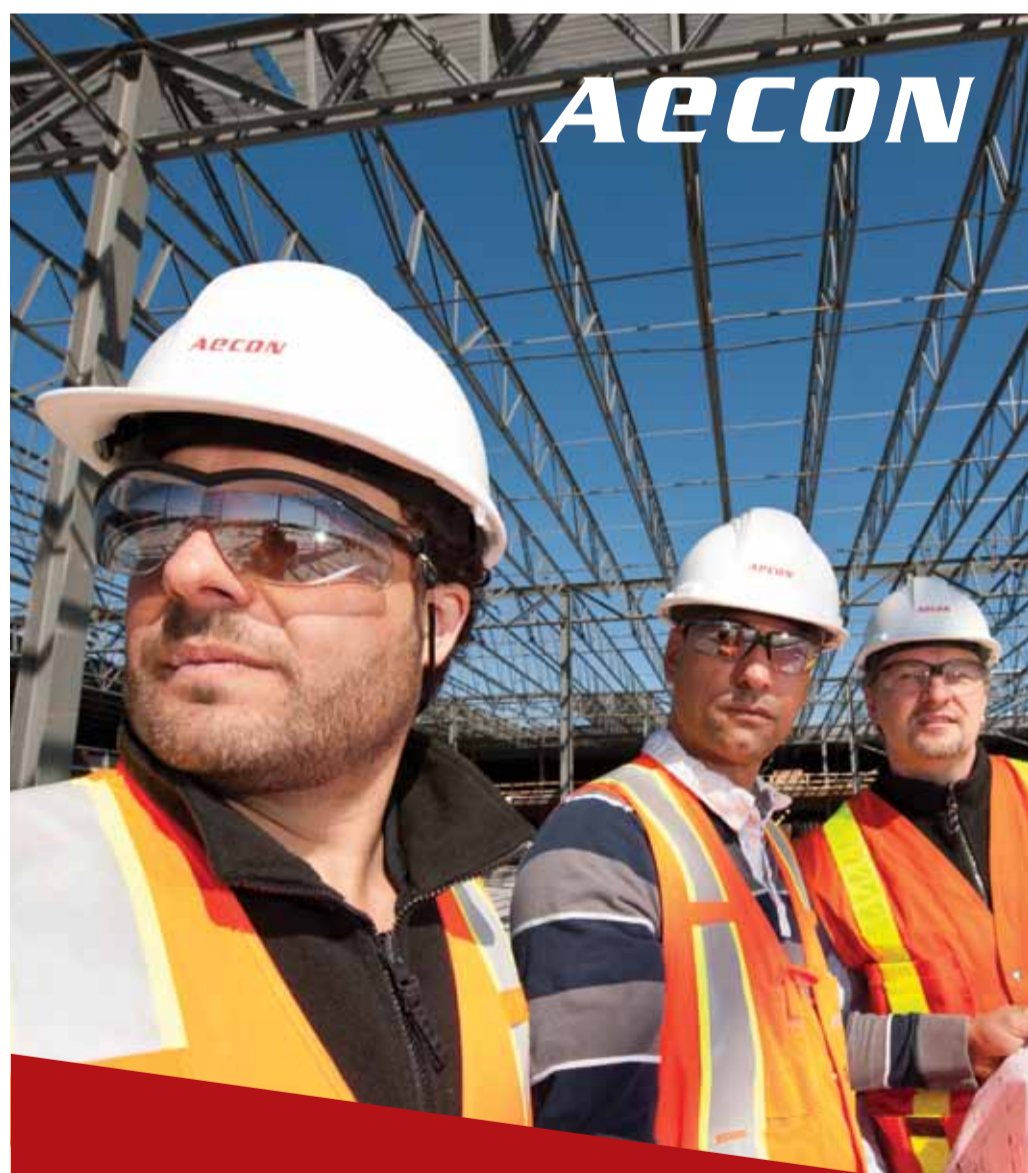
GENIVAR is one of the largest engineering services companies in Canada with more than **5,000 employees** in over **100 cities** in Canada and internationally. Ranging in size, its clients operate in various market segments, including the **buildings, industrial and energy, municipal infrastructure, transportation and environment** sectors.



WWW.GENIVAR.COM



2011 Schreyer Award Recipient
ASSOCIATION OF CONSULTING ENGINEERING COMPANIES | CANADA



AECON

BUILD YOUR CAREER WITH AN INDUSTRY LEADER

As one of the country's largest and most diverse construction and infrastructure development companies, Aecon is proud to carry on the tradition of building things that matter in Canada. Our streamlined approach offers clients seamless solutions for even the most complex projects, along with the peace of mind that only a company 100 years in the making can deliver.



Start building your career today at Aecon. Visit our website to learn more about the opportunities that await from coast-to-coast.

- // MINING
- // TRANSPORTATION
- // POWER
- // UTILITIES
- // SOCIAL INFRASTRUCTURE
- // OIL & GAS



aecon.com

PANEL OF EXPERTS

	Question 1: Historically, what have been the greatest challenges for Canada in terms of government structure?	Question 2: The Alternative Financing and Procurement (AFP) model originated in the UK. Has this proven to be effective and sustainable?	Question 3: Are we using the exact same model here in Canada and is this the same across all provinces?
 Jim Dougan President, Central and Eastern Canada, PCL Construction Canada Inc.	It's been widely quoted that Canada is facing an "infrastructure deficit". Governments need to upgrade public infrastructure to meet the needs of its citizens and help expand local economies. The track record of the public sector delivering large, complex, infrastructure projects on-time and within budget has been sporadic and these assets have not been maintained properly. This has spurred the growth of P3s as construction risk and asset management is transferred from government - providing an innovative way for the government and private sector to deliver on projects and provide value for money for the taxpayers.	Governments in Canada have embraced the concept, and have empirical evidence regarding the benefits, of using P3s to build critical infrastructure. As a result, the P3 marketplace has evolved to the point where governments, builders, and financiers understand the model. All partners have been refining the processes, and have invested resources, to ensure that the P3 model can be sustained. We also have a growing list of projects to serve as a reference for the success and long-term effectiveness of the P3 model.	The model is similar , but there isn't one standard process that applies to all P3s across the country however there has been a lot of coordination and cooperation between jurisdictions in developing the marketplace. The establishment of P3 agencies such as Partnerships BC, Infrastructure Ontario, and PPP Canada has helped standardize the bidding and procurement process. This provides bidders with a clear vision of the bid criteria and allows governments to effectively review the bids and select the best proponent for the job.
 Brad McLellan Partner, WeirFoulds LLP	One of the greatest challenges Canada has faced, historically, in terms of infrastructure renewal and development has been where the funding or financing comes from. The amount of money required for infrastructure renewal and development is significant. Until about 10 years ago, it was Senior Government that would fund most of the required infrastructure renewal and development, but Senior Government can no longer make all of the required long term and large financial commitments.	Infrastructure Ontario's Alternative Financing and Procurement (AFP) model was first used in the hospital sector and has since been used by Infrastructure Ontario for courthouses and other infrastructure projects. The AFP model has certainly been successful in hospital projects and in attracting private finance. It is unclear how effective and sustainable it will be in the growing municipal projects sector. The AFP model and the template AFP documentation will need to be flexible when the model is applied in municipal projects.	The AFP approach utilized by Infrastructure Ontario is similar to the model utilized by Partnerships BC, but there are some differences. Similarly, the models utilized by both provinces have similarities to the PFI model utilized in the UK. None of the models is exactly the same, but the manner in which projects are structured, the importance of optimal risk allocation, the need to establish "value for money", and the approach to obtaining private financing for public infrastructure projects is similar under all of the models.
 Mark Romoff President & CEO, The Canadian Council for Public-Private Partnerships	All levels of government have been facing overwhelming infrastructure deficits matched by equally challenging fiscal realities. The investments made following the credit crisis did have an impact, but there is more required. As a result, public-private partnerships are moving increasingly to centre stage as an innovative vehicle for infrastructure development and service delivery. Notably, municipalities and First Nations communities are joining provinces and territories in their growing interest to explore the P3 approach and the economic impact that derives from their innovative design, private financing and long-term sustainability.	Under the Private Finance Initiative (PFI) program in the UK, which was the first and largest P3 program in the world, 712 projects worth over US\$86 billion have closed over the past 20 years. The project pipeline has decreased in recent years and PFI is currently under review to look at ways to improve value for money. The UK is looking to the Canadian model to improve the procurement and delivery of P3 projects. This is a reflection of Canadian efforts to adopt international best practices and our successful P3 record across a diverse portfolio of projects, including hospitals, urban transit systems, highways, schools and courthouses.	The "Canadian model" grew out of the lessons learned from the UK and Australia. Canada is now seen as a "best in class" P3 market because of its relatively short procurement times, predictable deal flow (governments follow through on commitments to the P3 model), flexibility in responding to pressures such as the credit crisis and its competitive pool of domestic and foreign bidders. Provinces do not have identical procurement processes, but there is consensus in the market that value for money is a cornerstone of each and that all are characterized by healthy competition, and appropriate allocation of risks.
 Nick Stark, P.Eng., LEED® AP Principal, VP Knowledge Management, HH Angus & Associates Limited Consulting Engineers	We see three main challenges. 1) A historical disconnect between capital and operating costs. There was no mechanism to spend an extra nickel on an enhancement to gain a dollar of future operating cost savings. 2) Too many decisions were made on past experience, resulting in facilities that met the best practice back then but did not consider the life span of the facility. 3) Many decisions on which projects would get funding were based on political expediency and not the needs of the public.	Adopting from the UK framework was of great benefit as the process in Canada was developed. Each entity has built on this experience and now has a much more mature model than when they started. As an example our process to get from Preferred Proponent to Financial Close was in the order of three months on large projects such as Royal Jubilee Hospital and CHUM whereas in the UK it can take a year or more.	The overall process is more similar than divergent, but having been involved in multiple bids in British Columbia, Ontario and Quebec has allowed us to see differences. Some of these include the use of indicative designs, performance vs prescriptive criteria, user interaction, affordability caps and funding models. The biggest difference has to be relative emphasis on how capital costs are balanced against the quality of the design. Shifting the focus more to design can drive innovation, and we've seen this succeed in Royal Jubilee Hospital and CHUM.

"WeirFoulds LLP has leveraged its traditional depth in municipal law to acting for Ontario municipalities on infrastructure and P3 projects."

Expert Magazine

WeirFoulds works at the centre of infrastructure and P3 projects.

To find out more about our infrastructure and P3 practice, contact:

Bradley N. McLellan
416.947.5017
bmclellan@weirfoulds.com

Daniel P. Ferguson
416.947.5029
ferguson@weirfoulds.com

Protect your assets. Gain a **strategic** advantage. WeirFoulds LLP.

416.365.1110
www.weirfoulds.com



100 years of building careers

Dufferin Construction Company, a division of Holcim (Canada) Inc, a member of the Global Holcim Group, has developed a solid reputation for market excellence, which has been built on 100 years of quality, stability and innovative leadership in the marketplace. Today, with the strength of our employees we are one of the largest infrastructure development firms delivering construction services to many of Canada's largest construction projects.

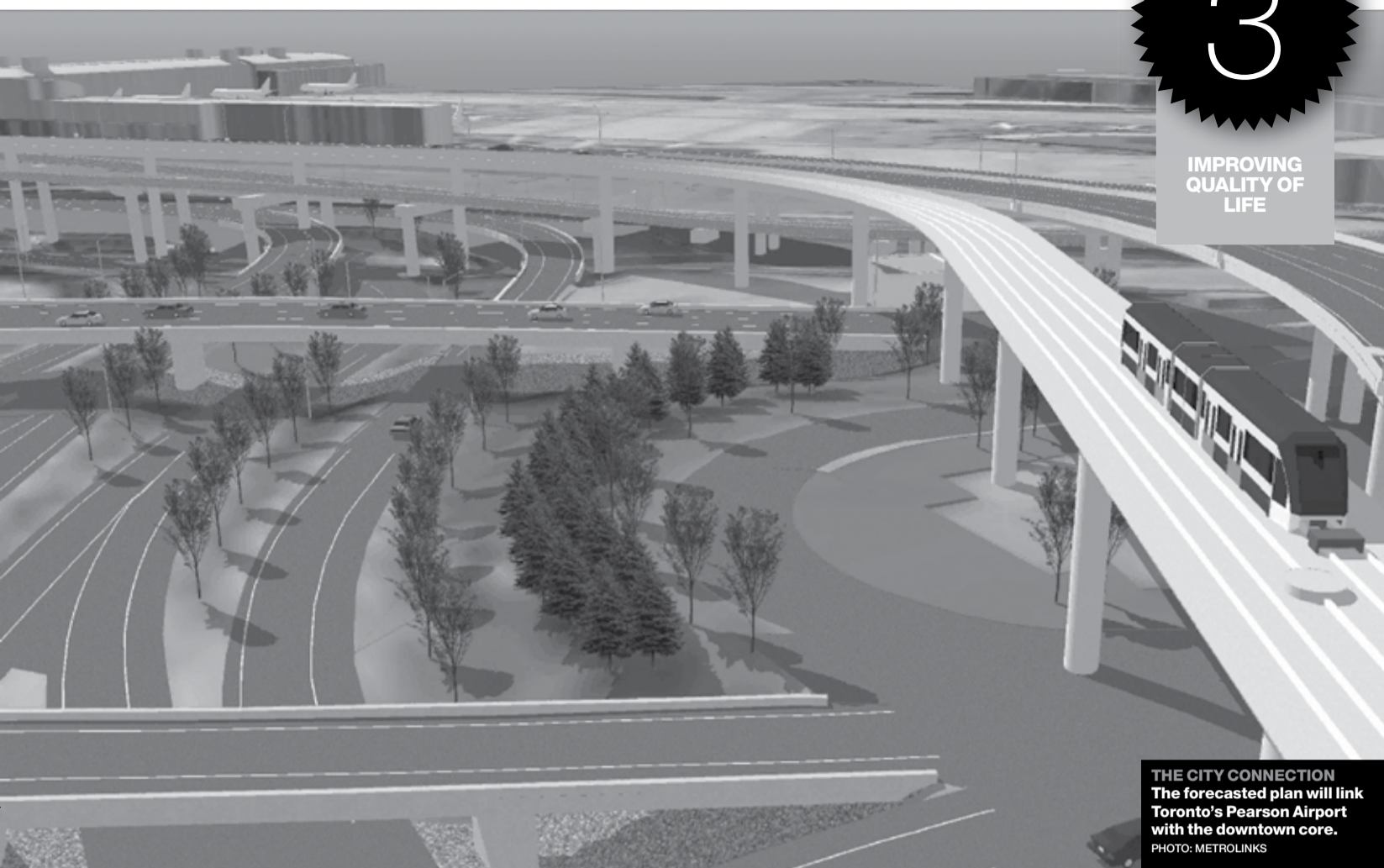
If you are a driven, motivated individual and are interested in building your career through one of our many exciting projects, please visit the careers section of our website.

www.dufferinconstruction.com
www.holcim.ca
Follow @Holcim_Canada on twitter

100 Years of
Strength. Performance. Passion



NEWS



INITIATIVE
3
IMPROVING QUALITY OF LIFE

THE CITY CONNECTION
The forecasted plan will link Toronto's Pearson Airport with the downtown core.
PHOTO: METROLINKS

The benefits of the Air Rail Link

Residents and travellers to Toronto have long awaited a direct rail link between Pearson International Airport and downtown's Union Station. That vision will become reality by the time the city hosts the Pan/Parapan American Games in 2015.

As one of Ontario's most ambitious and anticipated infrastructure projects, the Air Rail Link (ARL) project is overseen by Metrolinx, the provincial government agency charged with integrated transportation planning and development for the Greater Toronto and Hamilton Area (GTHA).

The Air Rail Link will operate on a 25 kilometre route, sharing the upgraded GO Transit rail corridor along the Kitchener line (formerly the Georgetown line). A three kilometre rail spur will be constructed to connect the Kitchener line to a new ARL passenger station at Toronto Pearson's Terminal 1.

Following a competitive tendering process, Infrastructure Ontario, on behalf of Metrolinx, awarded the \$128.6 million contract to Design,

Build, and Finance the spur and the new ARL passenger station at Terminal 1 to AirLINX Transit Partners Inc., a consortium between Aecon Construction and Materials Limited and Dufferin Construction Company (a division of Holcim Canada Inc.).

"We are pleased to move forward with this highly anticipated project," says Mark Rivett, senior vice president of Transportation at Aecon Group Inc. "Current activities include design and engineering, as well as geotechnical

investigation, as we look forward to a spring construction start."

The longterm benefits

Though the new service will be initially critical to athletes and visitors during the 2015 Pan/Parapan American Games, it's the ARL's long-term benefits that will be felt by the region's residents for years to come. An estimated five million vehicles travel between downtown Toronto and Pearson, with that number expected to

grow to nine million by 2020.

The ARL is expected to cut 1.2 million of those car trips annually, helping to reduce traffic congestion. The project is also expected to boost economic growth across the GTHA and support and encourage an expanded role for Toronto Pearson International Airport as a premier international gateway to Canada and North America.

"Dufferin is proud to be working on this complex infrastructure project, which will have an incredible impact on travel in the province," says James Wildish, manager of Partnership-Ventures of Dufferin Construction Company. "As we enter the first phase of the project, we are excited to bring the team's collective expertise to the table and execute this construction project successfully."

Global cities around the world have rail links connecting their airports to the downtown area, and soon enough, Toronto will be among them.

FACTS

■ **More than five million people** travel between downtown Toronto and Toronto Pearson International Airport, and that number is expected to reach nine million by 2020.

■ **Person is among** the busiest airports in the world without a rail link to the city's downtown core.

■ **Travel time** between Union Station and Toronto Pearson will be approximately 25 minutes along the 25-kilometre rail corridor.

■ **The Air Rail Link** will operate Tier 4 clean diesel multiple units (DMUs), which have the potential to be con-

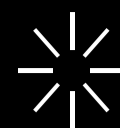
vertible to electric propulsion.

■ **The Air Rail Link** is expected to remove 1.2 million car trips in its first year of operation alone.

■ **Design and construction** of the "spur line" and new ARL passenger station at Toronto Pearson will help strengthen the economy and support and create more than 1,200 jobs.

Read more on the web:
www.metrolinx.com/airrailink

TED KRITSONIS
editorial@mediaplanet.com



DON'T MISS!



PHOTO: LUTHER CAVERLY
Winnie Ye
Canada Research Chair

Discovering a new female workforce

Jenna Wiens has always wanted to help people—growing up, she assumed she'd be a doctor. As a high school student with a 98 percent average, a career in medicine was within her reach. But a week at Carleton University's Go Eng Girl program changed everything.

"I went from having no idea what engineering was to enrolling in Carleton's electrical engineering program," says Wiens, who graduated from one of the largest engineering faculties in Canada at the top of her class.

Now a graduate student at MIT, Wiens was well prepared for advanced research. A hands-on education and an NSERC undergraduate research award at Carleton allowed her to develop wireless sensor networks for the innovative smart apartment in the Élisabeth Bruyère Health Centre. "I use technology in medicine to help diagnose and cure patients," she says.

"Female high school students often fail to see engineering as a potential academic path. They are surprised how creative and people-focused engineering is," says Winnie Ye, a Canada Research Chair specializing in silicon photonics for biomedical, telecommunication and renewable energy applications.

As a mentor in Carleton's Women in Science and Engineering chapter, and a graduate of the university, Professor Ye helps foster interest in engineering and innovation among young women. She wants more students like Wiens to experience Carleton's unique engineering programs and supportive learning environment.

"Carleton is a leader in engineering teaching and research," she says. "I want other women to know how accessible engineering is—and that it can help them to change the world."

AMANDA COUCH
editorial@mediaplanet.com

MEDIA PLANET

The global leading publisher of industry focused reports

LOOK FOR THESE UPCOMING TITLES:

- ➔ Aboriginal Affairs
- ➔ Smart Grids
- ➔ National Defense
- ➔ Exploration

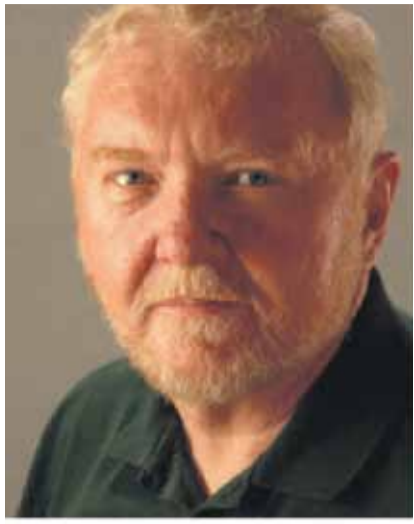
Advertise with us!

Interested in participating in an upcoming section?
Contact: Clayton Hartford, Publisher, Mediaplanet Toronto
Phone: 416-583-2202
Email: clayton.hartford@mediaplanet.com

[TWITTER.COM/MEDIAPLANETCA](https://twitter.com/MEDIAPLANETCA)
[FACEBOOK.COM/MEDIAPLANETCA](https://facebook.com/MEDIAPLANETCA)



CANDU Reactors – Ontario’s Best Option for Clean Energy, Clean Energy Jobs and Clean Air



BY DON MACKINNON

President
Power Workers' Union

Each new independent review makes it more difficult to ignore the flaws in Ontario’s wind, solar and natural gas generation strategy. Also increasingly evident is the absence of adequate analyses and planning in electricity policy development and implementation.

Hard-pressed Ontario ratepayers are paying large subsidies to multi-national wind and solar developers. Ratepayers will also pay for: new transmission and distribution lines to connect these intermittent power sources; new natural gas plants and associated transmission lines for back-up when the wind isn’t blowing or the sun shining; and “smart grid” technologies necessary for managing these constantly changing outputs to maintain reliability. Concurrently, consumers face the unavoidable costs of keeping today’s aging transmission and distribution systems functioning.

Promised green energy job numbers appear to be inflated and unsustainable, in spite of the billions being spent. Worse yet, the stated goal of improved environmental performance is undermined by the need to back up intermittent wind and solar generation with carbon-emitting natural gas plants over 70 percent of the time.

Building new CANDU reactors and refurbishing Ontario’s existing nuclear reactor fleet offers a much better way to deliver clean energy, clean energy jobs and clean air.

For 50 years, CANDU reactors have safely and reliably produced greenhouse gas (GHG) emission-free electricity for Ontario homes and businesses. Nuclear energy is the best way to: meet our 24/7 electricity needs; provide a price hedge against fluctuating energy prices; and ensure long-term energy security by minimizing Ontario’s reliance on imported energy. Ontario can generate even more economic and environmental benefits by exporting this clean energy to our fossil fuel dependent neighbours.

Ontario is a major beneficiary of Canada’s \$6.7 billion a year nuclear industry, hosting many of the 160 supply chain companies and associated 70,000 direct and indirect high value jobs. Independent analyses show that refurbishing Ontario’s nuclear fleet and building new CANDU reactors at the Darlington Nuclear Station will generate tens of thousands of person years of new employment and billions in economic spin-offs, including R&D at our universities and colleges.

A decision to build new CANDU reactors would send a powerful signal to the global marketplace. Romania, Argentina, China and India already have CANDU reactors. This reactor’s distinctive design uses natural rather than enriched uranium, has the unique ability to reuse fuel from other reactor technologies, can use thorium unlike other reactor types (a big advantage in the Asian market), and is suitable for small grid systems. These are substantial competitive advantages.

The environmental benefits of a renewed and expanded nuclear fleet are also compelling given the importance of reducing GHG emissions. A September 2011 National Roundtable Report on the Environment and Economy concluded that unless GHG emissions are reduced, the economic impacts of climate change to Canada could be billions of dollars per year.

Annually, about 90 million tonnes of GHG emissions (equivalent to the exhaust of 18 million cars) is avoided. Since 1972, this has helped Canada avoid over 2.4 billion tonnes of GHG emissions.

The scheduled closure of the 3,000-megawatt Pickering Nuclear Station in 2020

highlights the importance of expediting new reactor construction at Darlington. The low-carbon electricity from these new CANDU reactors will help replace Pickering’s production, and is ideally suited to power zero-emission electric vehicles, reducing GHG emissions from Ontario’s biggest emitter – transportation.

Ontario’s long-term energy plan recognizes the benefits of nuclear energy and it is time that Ontario’s elected federal and provincial representatives collaborate to expedite investments in CANDU. It’s fundamental to ensuring Ontarians receive reliable, secure and environmentally responsible electricity at a price they can afford.

**NEW AND
REFURBISHED
CANDU
REACTORS
ARE GOOD
NEWS FOR
ONTARIO'S
ELECTRICITY
SYSTEM,
ENVIRONMENT
AND ECONOMY**

- Ensures safe, secure, low-cost, reliable electricity 24/7 for the long-term
- Helps Ontario and Canada significantly reduce greenhouse gas emissions
- Enables zero-emission electric vehicles and low-carbon electricity exports to our fossil fuel dependent neighbours
- Supports Ontario’s successful \$6.7 billion a year nuclear industry and its 70,000 high value jobs
- Generates billions in economic spin-offs that stay in Ontario

Ontarians deserve reliable, secure, and environmentally responsible electricity at a price they can afford.

For more information please go to www.abetterenergyplan.ca

**FROM THE PEOPLE WHO HELP
KEEP THE LIGHTS ON**