

# Sustainability Now

Newsletter of the Sustainability Initiative  
of the Association of Professional Engineers and Geoscientists of B.C.



## If not now, when? If not us, who?

### Editorial

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#### Transportation

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**Transportation.** Much broader than its definition as a "means of conveyance or travel from one place to another" (Webster's New Collegiate Dictionary) transportation is inextricably linked to the natural environment, the layout of communities, the availability of jobs and resources, the consumption of energy and even, according to some, the occurrence of wars between nations.

What about sustainable transportation? What makes one transportation solution more sustainable than another? How does all this relate to professional engineers and geoscientists? According to the [Organization for Economic Co-operation and Development](#) (OECD), a sustainable transportation system has to address eight principles: access, equity, health and safety, education and participation, integrated planning, land and resource use, environmental integrity and economic well-being.

Consider, as an example, that technology is providing us with more options to drive highly efficient, clean-running vehicles. But as the per-capita vehicle ownership rate and the volume of vehicles on the roads continue to grow, road systems are increasingly strained. Between 1969 and 1995, the number of household vehicles in the US increased at six times the rate of the population (State of the World 2001). In London, England, the speed of traffic is the same now as it was a century ago when people traveled by horse-cart. Meanwhile, surrounding communities are experiencing declining quality of life and their environment due to noise and air pollution.

In terms of goods transport, road and air transport has surpassed rail as the dominant transport modes. As a result, transportation uses more energy, produces more air pollution and greenhouse gases and contributes to more congestion in our cities.

Research into the effect of traditional North American engineering 'solutions' to congestion has shown that increasing highway and arterial capacity often serves only to increase traffic volume, resulting in the same or greater levels of congestion. These findings lead to the fundamental question: is there too much traffic or not enough roads? The emerging thinking is that cities get the traffic volume they choose.

As citizens, where we choose to live and work, and how we get around in our own lives has an impact on our communities. As professionals, we have a further impact when we design transportation systems, recommend development solutions and make transportation-related choices in all fields of practice.

There are many questions we can ask that may lead to effective and sustainable transportation solutions. For example: Can we procure construction materials and equipment locally so as to reduce transportation impacts? Can we use some of the existing road capacity to create bike lanes and pedestrian-friendly boulevards and thereby shift modal demand? Can we design a road to minimize the volume and improve the quality of stormwater runoff? The projects described in this issue tackle these types of questions.

To ensure success in implementing solutions to transportation challenges, one key ingredient is the need for collaboration with affected communities, decision-makers and other professionals. Commitment from the level of government policy is also crucial. Because transportation is as much about land use, environment, policy, and overall quality of life as it is about moving goods and people, the need for collaboration is especially crucial in this field.

-Christy Love, EIT



## In Conversation with Richard Drdul, PEng, PTOE

### Community Transportation Planning Consultant

Richard Drdul, P.Eng, PTOE is a consultant and industry leader in the field of community transportation planning. He describes the focus of his work as "maintaining and enhancing community livability and safety."

I met Richard for lunch and plied him with Italian food. In return, he offered some of his thoughts on the state of transportation engineering and the nature of his work.

**CL: How have you carved this niche for yourself as a community transportation planner?**

RD: (Laughs) I'd like to say I was clever and planned it this way, but to be honest, I just stumbled into this work. I have a personal interest in cycling, transit and other sustainable modes of transportation, so when opportunities arose to do innovative work in those areas, I jumped on them.

(Continued on page 2)

## Richard Drdul Interview cont.

### **How would you describe your philosophy on sustainability?**

I prefer a simple definition of sustainability – not screwing up the planet for the next generation.

### **What does “sustainable” mean with respect to transportation engineering?**

Improving access to services, minimizing the negative impacts of traffic, and overall, making things better than they are today.

### **How would you describe the level of interest for sustainable transportation?**

There is more and more interest every day, particularly among residents. They see the livability of their communities deteriorating, and they point the finger at traffic for much of that. They want to regain the livability they lost, and they want to make their streets safer.

### **What does sustainable transportation mean for small communities?**

Surprisingly, small communities have a lot of the same problems as bigger cities, but on a smaller scale – too many parents driving their kids to school, motorists speeding through neighbourhoods, inadequate transit service, and a lack of bicycle facilities.

### **What role can engineers play in the shift toward more sustainable transportation?**

Many times I have been asked to come along afterwards and ‘fix’ an engineering project that people aren’t happy with. Typically, the reason they’re not happy is that no one listened to what they wanted. For any project, engineers should look for opportunities early on to incorporate sustainable features, and to “align” a project more with what the community wants. If engineers do this at the beginning of a project, it’s no big deal cost-wise, and results in a better project.

### **What do you see as the major barriers to bringing ideas about sustainability to practical application within the field of transportation?**

Inertia. By that I mean the average person’s unwillingness to change his or her travel habits. We could solve our transportation problems tomorrow if just 20% of people got up in the morning and did something other than drive their cars to work by themselves. Of course, there’s no chance that’s going to happen any time soon. Most people aren’t willing to change. I find that everyone is in favour of the concept of sustainability, but when it comes to making changes in their lives, it’s a tough sell.

### **Do you have any suggestions for overcoming these challenges/barriers?**

Look for simple solutions that are easy to implement and effective. Things like walking schoolbuses, traffic calming, bus bulges, paratransit services and in-pavement lighting at crosswalks, for example.

### **How do you convince skeptical clients that sustainable transportation options are preferred?**

I don’t use the word ‘sustainable’ at all. I used to, but I found that people don’t respond well to the word – it’s too vague, it’s overused to the point of being abused, and to many people it has overtones of environmental extremism. Instead, I focus on what people care about – safe communities and improved quality of life. If you focus on these issues, then you’ll generally cover off sustainability at the same time.

### **What is your general approach to making the ‘business case’ for sustainable transportation options?**

As I mentioned, I prefer to avoid the word ‘sustainable.’ Instead, I make a ‘business case’ for a transportation project based on community support, safety and other things that are important to residents, businesspeople and decision makers. In many cases, there’s no need to make a business case – people are clamoring for more sustainable transportation choices, even though they might not call it that.

### **How do you see the role of engineers evolving in the future?**

Engineers will work more closely with communities – residents, businesspeople and other stakeholders. These people are our employers. They pay the taxes that eventually pay for the services we design and the plans we develop, and they pay our salaries. Unfortunately, when it comes to transportation, most people blame engineers for the situation we’re in today. If we want to develop community support for sustainable transportation initiatives, we’re going to have to learn to work more closely with residents and others in the community, and understand their needs and objectives.

### **What are specific things that educational institutions, consultants, and municipalities can do to promote sustainability as an integral part of engineering and geoscience?**

Lead by example. Far too often, municipal staff, consultants and others who travel around talking about the need for more sustainable transportation are traveling around in cars by themselves. It’s a lot easier, for example, for a municipality to require employers and developers to implement carpooling programs, construct bicycle facilities and subsidize transit passes if the municipality has already done it themselves.

### **From your perspective, what are specific things that APEGBC could do to facilitate greater understanding and practical application of the ideas of sustainability for engineers/geoscientists in their work?**

Help provide information regarding sustainable transportation opportunities to engineers and others, especially to staff in small communities who might not have the same expertise and awareness of potential solutions that staff in big cities do. Also, make the information relevant and practical. We’ve all heard the motherhood statements about sustainability over and over again – what people want is useful information they can act on.

### **Lastly, what is your preferred mode of transportation?**

RD: Cycling. It’s so much fun riding a bike that it doesn’t do it justice to call it transportation.



Source: [www.smart.com](http://www.smart.com)

Smart™ cars use life cycle engineering to design their cars, considering energy used in all phases of their lives: from production through use to recycling

## Sustainable Streetscapes: Setting a New Precedent in Street Design

Facts and photos provided by Alexandra Steed, Greenways Landscape Designer, City of Vancouver Streets Division

Are you involved in the planning and design for a street upgrade? Are you planning to plug in a standard curb and gutter plus repave solution? Why not try something different; something that would maintain traffic flow, improve pedestrian safety and aesthetics, and enhance and protect the surrounding environment? Streets have an immense potential for not only moving traffic, but also providing effective stormwater management and other beneficial qualities for local residents and the environment. The City of Vancouver is making this important connection through a pilot project that it hopes will become a precedent for integrated street design.

Building on the success of other City initiatives and learning from [Seattle's Street Edge Alternative \(SEA\) project](#), Vancouver's first "Sustainable Streetscape" is becoming a reality thanks to the initiative of engineers and landscape architects at the City's Streets Division and their collaboration with local residents.

The project is located along a portion of Crown Street in the Southlands neighbourhood of Vancouver; a residential section 330m long, encompassing 21 lots on the east side of the street. The west side borders Musqueam Park and the south end leads onto Musqueam First Nations land. An existing landscaped island splits the roadway toward the south end, with current traffic patterns allowing two-way flow around both sides of the island.



Figure 1: Crown Street Before, looking south. Photo courtesy of Greenways.

### The Issues

Residents wanted the City to repair the worn and cracked asphalt street surface and decided that at the same time they wanted curb and gutter installed. Through the Local Improvement process, a petition was circulated among residents to request that the City repair the road and add curb and gutter. The Southlands Plan that governs the area prohibits curb and gutter in order to maintain the semi-rural character of the area. Residents were therefore seeking an exemption from this Plan. The City's Streets Division saw this as a great opportunity to try something different.

The challenge, according to City staff, was not in finding or implementing the technology, but rather overcoming people's resistance to change.

### The Solutions

#### **Traffic: Calming, Patterns and Parking**

Residents wanted to improve pedestrian safety and comfort,

maintain adequate and accessible parking, and slow through traffic. Current traffic volume is 650 veh/day, with the 85th percentile driving within the 50km/hr speed limit. Due to occasional vehicles speeding down the street, however, residents perceived traffic speeds to be excessive.

The design resulted in a narrowing and meandering of the driving surface to reduce sight lines and driving speeds without requiring frequent stops. The impervious area is also narrower than a standard street, with 5.6m of total hard surface (compared to the standard 8.5m). This surface is comprised of 3.6m of black asphalt plus 1.0m of concrete on each side, contributing a visual impression of an even narrower driving width.

Improved pedestrian comfort will result from slower vehicle speeds. Some sections of pedestrian paths are also separated from the road by vegetated areas, as shown in the sketches below.

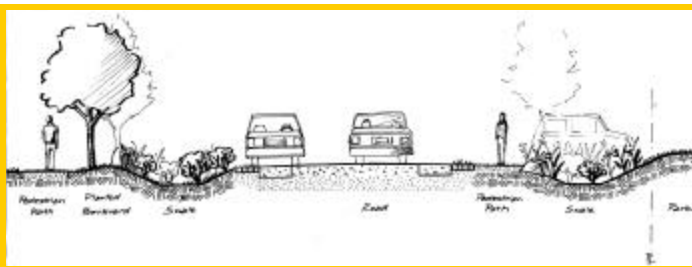


Figure 2: Sketch of typical section of new 5.6m wide two-way segment of Crown Street. Illustration by A. Steed.



Figure 3: Sketch of landscaped boulevards on new one-way segment bordering the island at south end of Crown Street. Illustration by A. Steed.

### **Aesthetics**

The proposed design maintains the semi-rural quality, creates an aesthetic connection with adjacent Musqueam Park, and improves the pedestrian appeal of the street. Pedestrian paths were designed to meander alongside and between informal groupings of native plants and natural drainage courses.

Residents were asked to contribute their landscaping ideas, while the landscape designer limited the plant and materials palette to maintain an overall coherence of design. Local, recycled and salvaged

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## Sustainable Streetscapes cont.

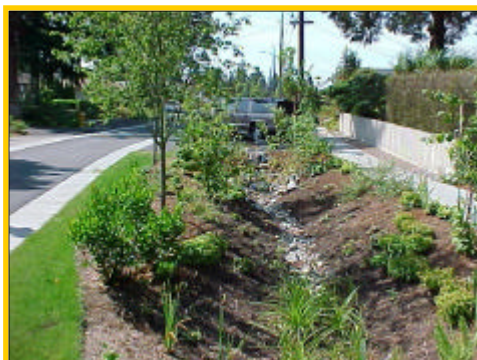
materials such as granite rocks and beached logs were used as natural landscape features and for practical functions like curb stops.

### Stormwater

A consideration of groundwater flow and quality were particularly important given the proximity of Musqueam Creek- the last natural salmon bearing creek in Vancouver. The specific goals of the design with respect to stormwater are to promote surface retention and infiltration and improve water flow and quality entering Musqueam Creek.

The narrowed paved street area and permeable pavement for pedestrian areas were designed to reduce the impermeable surface area. The street is also landscaped with biofiltration swales and infiltration areas on both sides of the street. The swales are lined with absorbent soils (high organic content) and anchored by absorbent vegetation to minimize the volume and rate of runoff. Swale vegetation serves to reduce flow velocities, stabilize the soil and remove pollutants. These features serve to increase the time of concentration and thereby reduce the risk of flooding. It is anticipated that the bio-swales will eliminate the need for storm sewers.

Figure 4:  
Biofiltration swale  
and landscaping on  
Seattle's SEA  
Project. Photo  
courtesy of  
Greenways.



### Maintenance

Residents agreed to maintain the boulevards adjacent to their homes. Low maintenance native species were selected to minimize labour needs.

### The Process

A key determinant of the success of this project was the involvement of residents and affected citizens in the design process. After the City drew up its initial design concept, four meetings were held with residents to discuss parking designs, traffic concerns and landscaping. Four surveys were also distributed at various stages of the planning and numerous informal information exchanges occurred between the designers and residents.

Some issues that were addressed through these forums included concerns about:

- ⊕ adequate parking capacity,
- ⊕ distance from parking to homes,
- ⊕ potential changes in property values, and
- ⊕ the potential for creating breeding grounds for mosquitoes in

the biofiltration swales

Because there was no local prototype to refer to, the design process was time-consuming in terms of outreach and educational needs. However, this extensive community involvement was well worth the effort, as it resulted in 90% public support for the project.

### Cost

Costs are expected to be similar to a standard curb and gutter/sidewalk improvement design. The extent and length of the consultation process will likely be reduced once this precedent is established and local experience increases.

Phase 1, as described above, is anticipated to go to construction in 2003. Phase 2 will continue the sustainable street design south on Crown Street through Musqueam Park to Musqueam First Nations land and will replace a major salmon bearing culvert. The extension of this project will enhance Musqueam First Nations' efforts to improve the water quality and habitat of Musqueam Creek.

For more information on this project, contact Alexandra Steed at alexandra\_steed@city.vancouver.bc.ca.

Follow this link to view an [in-depth paper](#) on the project.

## Resources

[www.sustainable-communities.agsci.ubc.ca/projects/DesignManual.html](http://www.sustainable-communities.agsci.ubc.ca/projects/DesignManual.html)

*Sustainable Urban Landscapes: Site Design Manual for BC Communities*. Compiled by the James Taylor Chair in Landscape and Liveable Environments. Highlights include an excellent "Sustainability Checklist" for community design.

[www.ci.seattle.wa.us/util/SEAstreets](http://www.ci.seattle.wa.us/util/SEAstreets)

The City of Seattle's Street Edge Alternative (SEA) projects.

## Small Cities with Big Visions

The City of Quesnel understands the links between transportation, air quality, development and economy

Prepared in consultation with Harlene Hunt, Transportation Manager and Councillor Mike Doyle, City of Quesnel

A small community of 11,000, the City of Quesnel has identified several goals related to its community development that have important links to transportation. These goals include improving local air quality, meeting 2010 Kyoto targets and bolstering the economy and environment. Perhaps surprisingly, the city shares a similar vision as well as many of the same challenges as larger communities.

The bowl-shaped topography and location of six saw mills and two pulp mills close to the downtown core have historically contributed to poor downtown air quality. The mills have taken significant

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## Small Cities with Big Visions cont.

proactive steps to reduce and improve the quality of their emissions. However, it was felt that the municipality also had a role to play. The City recognized that a reduction in automobile dependence could contribute significantly to improvements in air quality and overall liveability. A fundamental shift would therefore be required in terms of the way the community shaped its development.

This shift is addressed throughout the City's new Official Community Plan (OCP), adopted in 1999. Its neo-traditional development model aims to create pedestrian-friendly roadways with access to most services within a 5-minute walk of homes. To achieve this end, the OCP encourages a mix of land uses in the downtown core and other commercial areas. In practical terms, this translates to policies such as one to "allow multi-family residential development within the downtown designation only when the ground floor contains mixed uses." Another goal is to increase density downtown and in other commercial centres. The implementation of this goal is achieved through policies such as offering density bonuses to developers providing that a development "...be within a 5 minute walk of the downtown core or west Quesnel commercial area."

In terms of transport-specific goals, the OCP commits to improving sidewalk access and establishing bike and pedestrian trail networks. A key component of the OCP, though, is the development of an effective long-term transit system. The community had implemented a service in 1993 that only lasted for 20 months due to low ridership, and had until recently only operated a bare-bones handiDART system for special needs users. The sentiment reflected in the OCP was that a transit system could be successful, provided that it accurately identified and served local needs.

To this end, Councillor Mike Doyle, through his work as a Job Facilitator, discovered that unemployed persons were unable to access employment opportunities at the other end of town because they did not own personal vehicles. A transit system could therefore help these people connect with work opportunities while at the same time provide an alternative to other users accessing central commercial areas. By working closely with BC Transit to identify the specific needs of the community and potential new user markets, the City was able to implement a transit system that effectively serves the needs of the community.

The new incarnation of the Quesnel transit system was implemented in 2001. It has since undergone service type and route adjustments in response to user feedback. [\[Click here to read a more in-depth history of the progress and growing pains of transit in Quesnel.\]](#) The current system uses two Polar 20-passenger buses for the fixed-route service, plus a small van for handiDART service. The "McGruff on the Bus" traveling Safe House program was also launched in October 2002. This program adds value to the transit service by providing a traveling safe haven for anyone who is lost or afraid.

Even given the small size and sometimes harsh climate of Quesnel, the community's progressive OCP and new transit service are yielding great results: ridership was at 28,000 riders in its second year of operation (2002); sidewalks are being installed and upgraded throughout existing and new developments; and its 10km Riverfront Trail has become one of the City's most popular and well-used focal points, to name just a few...

[View Detailed case study of Quesnel transit: www.energyaware.bc.ca](http://www.energyaware.bc.ca)

[View The City of Quesnel's winning nomination for the Fraser Basin Council's Overall Sustainability Award](#)

## The Beddington Zero Energy Development:

**Is this what Vancouver's Southeast False Creek sustainable development might look like?**

The Beddington Zero Energy Development (BedZED) was completed in July of 2002 in Southwest London. Built on a former sewage-works, BedZED is the first large-scale "carbon-neutral" community. Not only does this development include innovative design, construction and operation elements but it also calls for its residents to make the shift toward sustainable living habits.

Design features include use of only on-site-generated renewable energy, optimized building orientation, water efficient appliances, wastewater recycling, rainwater capture, and solar panels on housing units for recharging electric cars.

Along with water and energy, transport was a primary focus for this development. BedZED adopted a three-point transport policy: reduce the need to travel, promote public transport and offer alternatives to using private cars. This policy was manifested in a number of ways, including: site location with good access to train, bus, and tram routes; selection of construction materials that were available within a 35-mile radius of the site wherever possible; bike



storage and links to existing Sutton cycling network; "pedestrian first" design and road layout; on-site charging points for electric cars and promotion of car co-ownership.

Other community-oriented features include incorporating a mix of residences, commercial operations and services within the community to cut down on commuting needs and developing an Internet shopping link with a local supermarket for regular coordinated deliveries. BedZED is aiming for a 50% reduction of fossil fuel consumption over the next 10 years as compared to a conventional development. A guiding principle of all aspects of the project was to enable residents to live within the globally available eco-footprint of 2.18ha/person (current UK average is 6.29ha).

Read more about [BedZED](#) and link to the [BedZED Construction Materials Report](#).

Follow the progress of the [Southeast False Creek Sustainable Urban Neighbourhood](#) development.



## Sustainability Now

Newsletter of the Sustainability  
Committee of APEGBC

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cillor; Alexandra Steed, Greenways Landscape Designer

### APEGBC Sustainability Activities

#### APEGBC Nominated for Sustainability Award

APEGBC was short-listed for a Sustainability Award by the Fraser Basin Council, in the category of "Improving Decision Making". This recognition was received as a result of the Association and the Sustainability Committee's work in producing the first modules of the "Primer for Sustainability". Awards were presented at the State of the Fraser Basin Conference held in January 2003. The list of winners can be viewed at [www.faserbasin.bc.ca](http://www.faserbasin.bc.ca).

#### Branch Sustainability Representatives

The Sustainability Committee is establishing sustainability representatives within the executives of individual APEGBC branches. The Rep will act as a liaison between the committee and the branch members. Representatives have been informally established within the Vancouver and Fraser Valley branches, but are still needed from other branches throughout BC. If you are interested in fulfilling this role, know of someone who might be, or have other ideas about how the branches can work more closely with the Committee, please contact: Cathy Marr, [cmarr@istar.ca](mailto:cmarr@istar.ca).

#### Sustainability Primer

Coming soon: practice specific modules on BUILDINGS and TRANSPORTATION. Current modules can be viewed at [www.sustainability.ca](http://www.sustainability.ca).

### Upcoming Events

#### MARCH & APRIL 2003

March 7

Vancouver, BC

SFU Harbour Centre

*Transportation Demand Management Workshop: Make the Move on Climate Change*

Info and Reg.:

Narissa Chadwick, [nchadwick@fraserbasin.bc.ca](mailto:nchadwick@fraserbasin.bc.ca)

On-line Reg: [www.bcclimateexchange.ca](http://www.bcclimateexchange.ca)

March 12

Vancouver, BC

BC Gas Building, 1111 W. Georgia

*USGBC Event: "Launching LEED-BC"*

Info: Rosie Hydes, [rosie.hyde@keeneng.com](mailto:rosie.hyde@keeneng.com)

March 26-27

Calgary, AB

*AltEnergy 2003 Conference and Exhibition*

Info and Reg.:

Linda Squires Ph:403.278.9881

[linmar@shaw.ca](mailto:linmar@shaw.ca)

April 9

Vancouver, BC

BC Gas Building, 1111 W. Georgia

*USGBC Event: "Building Integrated Photovoltaics"*

Info: Rosie Hydes, [rosie.hyde@keeneng.com](mailto:rosie.hyde@keeneng.com)

April 14-16

Calgary, AB

*Conference: Aboriginal Oil and Gas: Building Long-term*

*Sustainable Community-Corporate Partnerships*

[www.aboriginalmanagement.com/index\\_e.html](http://www.aboriginalmanagement.com/index_e.html)

Please check the [website](#) for more events. If you have an event that you would like to post on the website or in this newsletter, please send info to [clove@apeg.bc.ca](mailto:clove@apeg.bc.ca).

### George Santayana gets the *The Final Word*:

Science is nothing but developed perception, interpreted intent, common sense rounded out and minutely articulated.

-George Santayana

