F7.1

SEVEN
OUT OF SIGHT

"We have little understanding of where our water and food come from; the impacts of our cars and homes; the activities undertaken by others around the globe to support our lifestyle; and the effects we have on the environment and its people."

Paul Hawken - Blessed Unrest

Most people would agree that technology can sometimes be a blessing and sometimes a curse, perhaps even that it can be both at once. Today's hand-held wireless devices can connect us instantaneously to virtually any other point on the globe, yet at the same time produce a state of sensory disconnection from our immediate surroundings.

In the spring of 2012, ostensibly to protect its citizens from themselves, the City of Philadelphia, which is recognized as one of the more progressive municipalities in the United States, announced that it would be introducing 'E-lanes' on its downtown sidewalks. Lines would be painted down the centre of the sidewalk, dividing foot traffic in a way that would allow citizens to use their smart phones without bumping into one another W7.1 VID 2mins). When it was revealed the following day that this had been an April Fool's prank, many protested and asked that real E-lanes be put on the agenda for discussion at the next council meeting.

There is no doubt that smart phones can contribute positively to more liveable cities with lower carbon emissions. Finding the location of the nearest 'car2go' or the time until the next bus arrives at your stop, can encourage more people to use more energy efficient forms of transportation. And of course there are countless other applications of this technology that can support positive changes in our behaviour.

Philadelphia's lighthearted prank nonetheless makes the point that we have become increasingly oblivious to our physical surroundings — a sad state of affairs for anyone involved in the design of the built environment. The implications are more serious however, as an awareness of how communities function socially, economically and technically will be an increasingly important aspect of citizenship as the 21st century unfolds.

The technical infrastructure upon which cities depend, includes the systems that supply energy, water and food; and which take away liquid and solid waste of various kinds. In most cities in the developed world, these systems are large scale, linear and invisible. We set thermostats, flick light switches, turn on taps, empty sinks and flush toilets with little or no thought to where the points of supply and disposal are located, nor what the environmental implications of either might be.

These are not things we should take for granted any longer. In the face of more severe and frequent storm events, the scale of our infrastructure places large populations at risk, whether through flooding, power failure, water contamination, road or rail washouts, or other disruptions.

The decentralization of infrastructure was a hot topic immediately following the northeast blackout of 2003, which left approximately 45 million people in the US northeast and midwest, and another 10 million in Ontario without power for up to a week, when the flicking of a single switch overloaded the network. Progress has been slow however, and some jurisdictions such as British Columbia, continue to put their faith in new power generation mega-projects.

F7.2

In Europe the transformation is much further advanced. In Sweden for example, the Stockholm suburb of Hammarby Sjostad, developed in the mid-1990s, was one of the first to have a community energy plant fueled by domestic waste that is collected from every household through an underground network of pneumatic pipes. Now community energy plants, often generating both heat and power, are a prominent feature in many towns and cities, and wind turbines dot (rather than blanket) the countryside. The scale of these operations is important if we are to take ownership of our infrastructure at the community level.

Visibility is also key, and the most celebrated (though yet unbuilt) example is BIG's Amager Bakke Waste-to-Energy Plant in Copenhagen, scheduled for completion in 2017. The plant will be covered by a sloping roof that will function as an artificial ski hill. This is made possible by advanced combustion and exhaust-scrubbing technology that will render the smoke completely non-toxic. The smoke stack will be designed to emit a smoke ring for every tonne of CO_2 being emitted into the atmosphere, making — as architect Bjarke Ingles puts it, "something uncountable, countable. (W7.2 VID 2min)"

Decentralized infrastructure projects are now beginning to appear in Canada. Both the University of British Columbia in Vancouver, and the University of Northern British Columbia in Prince George have recently completed demonstration bioenergy plants, the latter generating heat only, and the former generating both heat and power. Both are district energy facilities serving multiple buildings on campus, and both reveal their inner workings to passersby through large, strategically placed windows. (F7.1 and F7.2).


F7.3

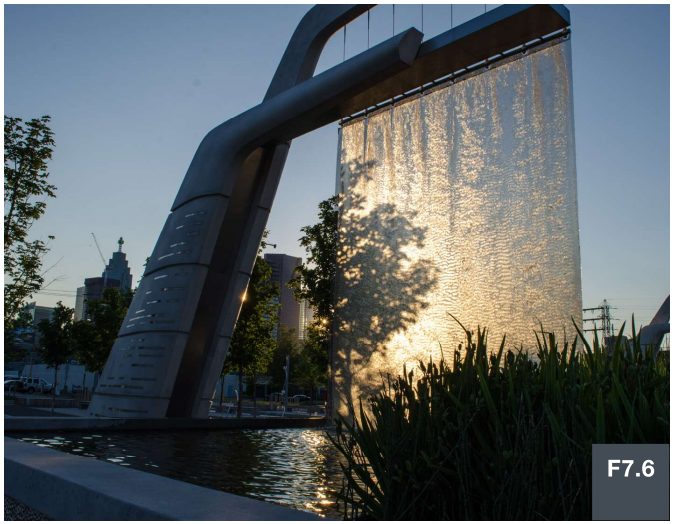

F7.4


F7.5

This kind of facility should be integral to every community, and in this regard the City of Vancouver has made a start. The City built its first neighbourhood energy utility (NEU) as part of the athletes' village development for the 2010 Winter Olympic Games. Located beneath the south end of the Cambie Bridge, the False Creek Energy Centre converts heat from the neighbourhood's waste water into low grade energy used to heat the buildings in the former Olympic Village. Although most of the structure is underground, street level windows give pedestrians a view of the pumps and pipes that do the dirty work (F7.3).

The truly celebratory aspect of this structure however, is a collection of four flues that emerge from the east end of the building. Rising like the fingers of a hand high above the bridge deck, the flues are connected to the gas boilers that provide heat; when demand exceeds supply, lighting at the top of the stacks changes colour from blue to red, according to the amount of heat being supplied by the boilers. Promoting community awareness and pride, this piece of functional public art was created by Walter Francl Architects, in collaboration with the artist consortium Pechet and Robb Art and Architecture (F7.4).

Similarly playful in character is the Sherbourne Common stormwater treatment facility in Toronto ON, that uses ultraviolet disinfection technology to treat neighbourhood stormwater runoff before it is discharged into Lake Ontario. The facility is the centrepiece of a public green space designed by PFS Studio, and includes a pavilion by Teeple Architects (F7.5) and three 9-metre high sculptural 'light showers' by Jill Anholt (F7.6) that release the treated water into an artificial river accessible to the public.


F7.6

F7.7

Because the area is susceptible to run-off from a combined sewer system during major storm events, the UV system is designed to treat the water to a standard 10 times higher than that required by Environment Canada regulations for human contact. The UV system also eliminates the chemical residue that would still be present in the discharged water, had a chlorine-based system been used.

Decentralized infrastructure projects are now being incorporated into large scale private sector developments. One of the first examples was Dockside Green, a multi-phase, mixed-use development in Victoria BC. Phase 1, designed by Perkins+Will includes both bio-energy and wastewater treatment plants, sized to serve what will ultimately be a 100,000m^2 project. When completed, the multiple phases of the development will be organized around a central greenway that Incorporates a series of ponds and bios wales (F7.7).

This greenway is a key feature in the project's water management system. Site storm water flows from the buildings and ground level concourses to the greenway where, along with treated black water from the on-site Waste Water Treatment Facility, it is filtered for reuse as grey water for toilet flushing and irrigation. This approach transforms what previously would have been a system of culverts and underground pipes into an attractive community amenity (F7.8).

These projects — and the many that I hope will follow in the future — have the potential to reconnect us with the infrastructure upon which a sustainable future depends. Decentralization improves resilience by making communities more self-sufficient, and by reducing the impact of service interruptions. Making the operation of these systems an integral part of our daily experience promotes engagement, and engenders a sense of personal or community responsibility.

F7.8