Resiliency Forever: Towards a System of Higher Yearning!

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Of course the first part of the title is a near redundancy but it has become increasingly obvious that while our climate change policies and programs may have real impact in some distant time, for the immediate future the damage of CO_2 emissions is already occurring – from rising temperatures and unpredictable weather events, to rainfall of a torrential character in some places and its non-existence elsewhere. And enough greenhouse gases are either stored in land masses, oceans and forests, or are already in the atmosphere to ensure their continuing impact until well into the next century.

Ironically CO_2's greatest impact however and thus its role in more severe environmental maladies is its contribution to human success and prosperity. At its core this is its problematic nature. A country's rising CO_2 production generally lines up quite well with its increasing wealth, and correlates nicely with factors associated with the United Nations Human Development Index (HDI) measuring such positive attributes as human longevity, foundational schooling for all, and those in post secondary education.

This very success has allowed for longer growing seasons, more productive farming methods, reduced starvation, more people advancing out of poverty and many into the middle class, greater urbanization freeing up lands for reforestation, unprecedented population growth, and access to cultural and digital resources beyond the imaginations of most people as recently as a few decades ago.

We live in a golden age. Our numbers of over seven billion may grow to ten billion by some time in the second half of the 21st century. We owe a lot of this to the energy intensive bonanza of carbon based fuels. Our Faustian bargain however has costs as described above. As well the increasing number of humans, a consequence of this carbon-based energy creates demands for other resources from rare and non-rare earth minerals, and fresh potable water, to necessary, but also often bizarre, consumables. In the process the biodiversity of plant and tree life, animal variety, soil quality, and ocean health to name just a few are increasingly stressed and in some cases threatened with extinction or such severe degradation they can no longer fulfill the roles we as humans have come to expect from them.

Let's consider the human predicament. Our very success puts many of us in places threatened by water shortages, severe weather, forest fires, climate instability, and unsustainable habitability for the numbers living there. Does it matter therefore whether CO_2 emissions have caused more severe hurricanes

We are a volunteer multi-disciplinary group of educators, researchers and professionals focused on the issue of resilience for Canada during a changing climate.

or forest fires, or if the factors behind them are too diverse for ultimate determination? CO_2 emissions have been at the centre of processes allowing for more successful, prosperous humans, more of whom live in, or near, places threatened by calamity. No longer are victims solely the hapless residents of trailer parks for whom it seems tornadoes have shown a marked preference for striking.

Worldwide, and regardless of developed status, cities (really urban regions) are the places in which more of us are now living, while urban lifestyles (from digital devices to expectations) characterize daily living regardless of residential location. The obligations and opportunities embedded within contemporary living carry a demand for resources associated with CO_2 emissions. Consider commuting. In urban regions most of us either travel through or to multiple jurisdictions not simply for work, but for schooling, entertainment, shopping, worship, medical care, family obligations and many other facets of living. These are both existential decisions and those for which we have little choice. They are unlikely to change. Likewise those outside these regions in turn depend on travel of even longer distances to such places for shopping, medical services and other attributes unavailable where they live.

While it's good news that economies associated with our CO_2 emissions have created general prosperity for many of us, our conundrum is agreeing on policies and programs to lower these emissions. We will not willingly, or may not be able to, change our lives and expectations or forgo behaviours to do so.

Thus we have two connected options. By all means address the problem of CO_2 emissions with greater efficiency but also expand alternate means from natural sources (daylight and windy ventilation where possible), to feasible renewable options, and interim sources such as natural gas and nuclear as replacements for coal. At the same time, increase general biocapacity from trees sequestering carbon and contributing to urban and rural splendor, to soils rich in productive fertility, and also support measures benefitting bees and insects as crop pollinators, while ensuring clean potable water.

Of immediate need however is a targeted strategy of resilience, such that what is already built is adapted for changing weather, natural systems are regenerated or added to as healthier contributors of eco system services, and new construction of either the built or the natural is designed, installed and then, most importantly, maintained for its life cycle ability to harbor us from the worst of this weather. In so doing this just might lay the foundation economically and professionally for a new model of future growth in which carbon is an increasingly negligible part of our prosperity.

How do we do this? Priorities include:

- Extensive green infrastructure either solely based on using natural means to control water flows, regenerate soils and tree life, and alleviate threats of flooding and unanticipated weather events, or through hybrid measures in which the natural and the human built are more symbiotically connected so one can come to the rescue of the other if there are failures or inability to adapt quickly,
- A movement away from highly centralized servicing functions of water, waste, and energy to those means which are more local, adaptable to discreet circumstances, easier to turn on and off as required, offer opportunities for local employment and civic engagement, and are the products of digital integration and human ingenuity,
- Net positive development in which the built environment increasingly acts as a biocapacity resource. Community gardens and beehives on roofs are elements of such mutual support but so are green walls, green roofs, natural sources of daylight and ventilation, greater connectivity with surrounding uses, adaptability for repurposing, use of locally appropriate planting and even xeriscaping, and integration with safe and regular mobility options beyond the car including public transit, walking, cycling etc.

Aside from the economic return and financial advantage of any project associated with the above and best answered in the marketplace, below are ten resiliency-based questions for public consideration of any new or re-purposed development.

"For many planning and design strategies, carbon mitigation and climate adaptation are synergistic and mutually reinforcing approaches"

Joyce Klein Rosenthal, Superstorm Sandy and the Age of Preparedness, Harvard Design Magazine 37, 2014

1. Does this initiative re-connect the quality of natural or built places supporting the bio-diversity and inter-relationship of living things?

Living things require connecting and supporting natural places in order to prosper, grow and evolve. Rural landscapes that provide only pockets of disconnected woodlots in a sea of monocultural agrarianism soon lose their bio-diversity.

Likewise suburban gardens have been found to have more songbirds than the surrounding countryside owing to each garden's (and increasingly front lawns) haphazardly varying interpretations by individual neighbors, as well their reduced or negligible use of pesticides. Successful built environments require as much connectivity as possible to improve the walking experience, public transit access, and to disperse car traffic amongst a wider range of options. Tools such as "walkscore.com" allow one to

determine the walkability of a place, and in some cases its public transit and cycling opportunities, though not necessarily either the safety or the quality of the experience.

Connecting these vital fabrics of life with and outside megapolitan regions through walking trails, waterfront natural connections, and measures such as daylighting urban streams (many of which, years ago, were submerged into underground channels where they are little more than storm sewers collecting rainwater and surface detritus and depositing them further downstream to contaminate larger water bodies), are aspects of such an approach.

2. Does this initiative add to the stock of resilient eco-system services including those supporting carbon sequestration, climate change resiliency, clean air and water, and local food production?

We know which features of the natural environment are more successful in sequestering carbon and cleaning dirty air. We know that a porous natural landscape allows water to filter into the ground and support increased natural fecundity while reducing the impact of flash floods. We know how to design for greater resiliency in recognition of unusual weather events and climate unpredictability. We know how to grow fresh food locally and make it available in underserved neighborhoods. We know that increased bio-diversity allows for greater resiliency in the event of unanticipated natural catastrophe.

Finally we know the value of eco-system services from honey bees pollinating plants, to the fertile soil in which these plants are grown. We know as well that many measures such as importing certain foods might make more economic sense than growing and storing them locally. Given an always limited amount of financial and human resources to be all things to all people, some choices, as former New York Mayor Bloomberg has said require us to select between possible poisons.

Eco-pragmatist Stewart Brand (Whole Earth Discipline: An Ecopragmatist Manifesto: 2009) for instance contrasts the environmental damage of pesticide and energy intensive growing regimes as against a problematic role for foods modified either genetically or through invasive grafting. We must make choices.

3. Does this initiative create something new, or renew and revitalize existing, human created assets from buildings to safe and vibrant communities?

Prince Charles, founder of a trust for building community (The Prince's Foundation), has observed that sustainability is only possible when people fall in love with a place. Only then will they invest their time, limited financial resources, and imagination in not just salvaging and reclaiming but enhancing what is there. As well they will guarantee that new things are built in such a way as to preserve and continue this love and have embedded within them the opportunity for future re-use for another purpose.

What might be added to this is their lifetime neighborhood quality. Is this a place that one could, if one so chose, live their entire life because it meets their needs – schooling, medical, mobility, housing, and the joy of living - at all stages of life's journey.

4. Does this initiative actively renew, or return to life, a decaying or lost resource; upgrade, improve or re-design an existing asset; or both of these?

Opponents of high-rise construction, and living, often shroud their real point of view with concerns about impact on their property values, a concern almost without merit in successful megapolitan regions.

While there may be some justification in objecting to the stark contrast of tall buildings next to single family houses and a desire for a more graduated-density configuration, as oft as not this is really a proxy for their antagonism towards "those" people, though who "those" are is never explicitly said.

"Those" people however are the focus of Toronto's Tower Renewal Project. This City of Toronto initiative aims to upgrade the energy and water efficiency of Toronto's high-rise residential stock while also providing for new construction in the often dead green spaces surrounding them. Its additional purposes include local employment, intensifying retail and other varied surrounding uses, while supporting public transit connections and mobility variety.

People living in these buildings are the primary focus for these opportunities. Many have affection for what has gradually evolved, even though outsiders might see these towers as somewhat run-down or architecturally dull. Important networks of human connection have been created while existing local retail often has changed to meet distinct ethnic food and material needs.

The meaningfulness of these types of places to their residents was expressed by a father following 9/11 in New York when he recalled his previous advice to his children that they could always find their way home because their neighborhood included the tallest buildings in the city. What were simply a mass of high-rises to others was a distinct local place to those living there.

5. Does this initiative anticipate and incorporate (even if a new project associated with mining, housing design, etc.), the opportunity for future repurposing? Or stated another way, is this is a cradle to cradle initiative, as opposed to a cradle to grave initiative?

At its simplest, cradle to cradle recognizes that the items we build and use should have the property of being used forever or at least until claimed by entropy. Cradle to grave on the other hand is the symbolic touchstone of a throw-away society in which we build it, use it, and then throw it away.

Cradle to cradle has bio-mimicry features in the way it replicates the constant flow of nature's material creations for different purposes. More commercially, Cradle to Cradle is a registered trademark of McDonough Braungart Design Chemistry (MBDC) consultants and a means of accrediting companies addressing this imperative. Like the LEED (Leadership in Energy and Environmental Design) system for certifying the green credentials of buildings and neighborhoods however its proprietary aspect also has a common sense and public commons-like application.

6. Do the annual energy and environmental services requirement of this completed initiative, including its ancillary implications, require one of the following:

(a) Additional energy and environmental service requirements beyond those already used by the existing asset(s),

(b) The same energy and environmental services requirement,

(c) Approach or aim for a zero sum requirement of external energy and environmental services,

(d) Add to the stock of energy and environmental services available for distribution in the broader world beyond the boundary and demands of this initiative.

This consideration goes to the heart of whether we believe we have an unhindered right to maximize our use of resources and that such use carries no health, environmental or geo-political implications. Belief in that unhindered right allows one to rationalize their profligacy as warranted, when it is in reality a thinly disguised "warlord-like" self interest in maintaining the status quo no matter how damaging this might be to others, including one's own children.

To the extent we lean in the other direction, the manner in which we design, or retrofit places, is central to a conversation not just on how to minimize energy and environmental impact but to actively add to the stock of such resources. Janis Birkeland's net positive development ethos for built places is a starting point for considering how to add to the stock of eco-system services in the places in which we live, work and navigate, as well as the infrastructure supporting us.

7. Does this initiative add value and character to a place, while being a replicable process for other places?

Words like charm, conviviality, serendipity, metaphysics of place, character, and lifetime support, all play into this discussion. Charm is those memorable elements that bring one back again and again to a place. Conviviality is the robustness of human contact and interplay within which everyone either is, or feels they could be, an artist. Serendipity is the unexpected opportunities and encounters out of which something good and magnificent emerges.

The metaphysics of place are often these hard-to-describe highlights of memory, meaning and experience and might include a lonesome train whistle in the distance, to the wind rustling through the trees, to the music of songbirds, to the light of the late afternoon sun, to the smell of fresh cooking, to the sound of many feet on the street guaranteeing one's safety but also directing one to a destination.

Character is what an area is known for and how it enhances those wonderful peculiarities while erasing the harmful or blasé. Lifetime support is how an area meets the needs of most people regardless of their age and mobility. Combined they are the stuff of the model place, though every place is unique. Other places may learn from them but ultimately each must respond to their own distinction.

8. By undertaking this initiative at this place does the initiative ensure that no natural or built feature is lost/sacrificed/relocated?

While this isn't always possible it is a worthy foundation on which to continue a place's further evolution. Kevin Lynch describes the significance of well-known nodal points and places that provide ongoing identification for residents and visitors. Preservation of a once prominent but now down on its heels structure provides opportunities for envisioning renewed uses and strategic additions.

Consider as one example New York City's High Line walkway on a once functioning overhead rail line. It was re-purposed as an in-the-sky linear greenway. Its success has seen the flourishing of both surrounding property values and retail variety, while its impact on tourism, public safety, and local pride is incalculable.

Houston's Buffalo Bayou and Singapore's Bishan Park, wandering through their respective city centers, were revitalized and integrated with physical and recreational infrastructure. They exemplify built and natural initiatives throughout the world each distinct to their setting. Toronto's Distillery District on the site of a once prominent whisky manufacturing plant and Birmingham's Custard Factory (United Kingdom) as a creative, digital and media quarter, are other successful re-imaginings of built places.

9. Does this initiative ensure that minimal embedded energy is lost on the site on which it is undertaken?

This may seem to be of limited concern but not only does it mean less is being transported to waste gathering places, but that the embedded energy, and therefore the work and lives of its former occupants, is honored.

Energy resources are not only subject to varying finite or accessibility limitations, but require continual investment of always limited financial resources that could be spent on projects with increased

bio-diversity benefit, and others that lower energy demand. Attending to this point not only carries into the future the past investment in securing these resources for the entire construction and maintenance process, but it limits in intensity and impact the necessity for continued extraction and use of further resources and their eventual disposal, depending on type, as carbon emissions or as nuclear waste.

10. Does this initiative have a resilient, long term authentic public engagement process which includes visioning, active participation and the assumption of obligations beyond one's self-interest?

This is a way of tapping into local enthusiasm, project support, and the uncovering of past knowledge about a place that can transform an entire initiative. It is also about public education and the sense of obligation we all have for not only our place in the world today but that of future generations. It is the ethic of planting a tree whose full expanse one will never see or experience. It is a way of living with rather than against the world. It is a way of adding to rather than subtracting from the health-giving properties of such places. It is an ethic that looks beyond one's narrow self-interest and sees in a larger public realm, not only renewed places and joyous experiences, but an increased bio-diversity in which one's own individual and family life flourishes and prospers.

In conclusion it accelerates a process for an engaged, committed and authentic civic life, not only for decision-makers and first tier designers, such as architects and engineers, but also the maintainers, operators and public who act as the life cycle guarantors of resiliency in what we build and retrofit.