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Climate Risk and Housing Affordability

We are likely to shoot past 1.5C global rise in temperature, sometime in next decade or two.

- It will be hard to estimate severity or frequency of climate events, but extra dollars spent now will avoid \$1000's later.
- Climate events, whether just damaging or catastrophic, will disproportionately affect those least able to afford it. In the aftermath of these, the poorest are likely to have less capacity to respond
- Degradation of buildings due to wetter and more severe weather will come with additional on-going financial burdens

As an architect and partner in a firm involved in affordable housing, I will discuss some of the mindsets that we apply in the design of affordable housing that could be equally be applied to urban planning.

Reduce risk from climate change

As climate events become more frequent and severe, we will need to be proactive and not merely reactive.

- We have to assume that current approaches, standards and systems will be found to be inadequate at some time
- However, current technology and design measures exist that can increase resistance to tornado, flooding, sewer backup, more rain exposure without normal drying periods. We need to evaluate and include these in advance of catastrophic events.

Build community resilience & encourage localization

- Establish community facilities as hubs with multiple resources (schools/health centres/community centres). These can become a focus during emergencies
- Encourage sharing of resources – neighbours helping neighbours (shared amenities, tools)
- Design community spaces to encourage social interaction, pedestrian connectivity, paths that cross – this builds community health
- Design for hands-on engagement by people and integration of community processes into everyday life
- Localize food production/storage/distribution
- Encourage local employment

Build Redundancy

Build redundancy into our infrastructure (when one system goes down, another one is available)

Localize energy production and decentralize distribution (especially when grids are more at risk of failure through shortage of maintenance)

- Avoid lack of capacity in existing parts of grids for the addition of photovoltaic renewables
- Bury hydro – replace poles with trees (and avoid system collapse during ice-storms)

Use natural landscape as a tool to mitigate climate change impacts

- Captures carbon
- Natural environments are better for our health – physical and emotional/psychologica
- Natural landscapes create more attractive urban spaces
- More overland water flow can be retained or buffered during major rain fall events

Durability

Climate will get wetter, windier, and severe

Normal deterioration of buildings will be accelerated

We need to move from a 25-35 year building lifespan horizon to a 50-75 one

As new construction is getting more expensive we need to design and construct with greater durability to protect this investment

Lower operating costs energy

- Our experience is that through reasonable care in the design and construction, we can build buildings that are 25%-48% more energy efficient than conventional construction at little or no extra cost
- If energy and operating upgrades are financed over the lifetime of a mortgage – there can be monthly savings from day 1
- Achieving higher performance is not difficult. The tools are available, and construction industry knowledge is growing
- For deeper energy savings (Passive House and Net Zero), the extra cost of construction is <10%

Ottawa is one of the lowest density cities on the planet. A vast majority of housing here is energy intensive ground related single family homes (higher \$/sq ft energy cost, higher transportation costs due to low density).

Most of the planning focus for new development is concentrated where it is politically easier, and much of this is in energy intensive high rise buildings.

We need to seriously expand the middle ground, with mid-density development, some of this located in existing low-density communities. Deep energy savings are easier to achieve in mid-rise multi-dwelling buildings.

Reduce fossil fuel use

With radically improved energy efficiency of buildings, all-electric buildings are much more feasible.

When energy loads are reduced significantly (such as to Passive House levels) – the premium on the cost of electricity is less than the fixed monthly charges on an individual household residential gas bill (1 consolidated energy bill is cheaper than 2).

Electricity also offers more hope for substitutions using renewable energy than natural gas.