DRAFT DISCUSSION PAPER ON DENSITY FOR COBOURG
FOR MARCH 3, 2021 SCCAC MEETING

FUNDAMENTALS OF ADDRESSING CLIMATE EMERGENCY

The earth is finite – and only one earth.

Every step takes energy and other resources (land, water, etc) - to build and then to operate. From mining/extraction of the raw materials, to manufacturing/processing, delivery of products; and assembly and construction.

Every step results in contamination and waste by-products – including the steps to create renewable energy (solar panels, windmills, electric cars/batteries)

Conclusion: We cannot consume the same amount of energy we presently do, even if it is renewable energy. Nor can we consume the same amount of resources (land, water), if we are to save the planet.

> *In the 1960s, humans took about three-quarters of what the planet could regenerate annually. By 2016 this rose to 170 percent, meaning that the planet cannot keep up with human demand, and we are running the world down*. https://e360.yale.edu/features/avoiding-a-ghastly-future-hard-truths-on-the-state-of-the-planet; Yale Environment 360, Published at the Yale School of the Environment

Thus, first principles:

1. Reduce
2. Reuse
3. Recycle – this is the last on this list since to recycle uses energy and often other resources, and produces waste by-products

HIGHEST SOURCES OF GHG EMISSIONS

The 3rd overall highest source of GHG emissions is **road transport** (the first being power plants, the second our homes). (Insert slide)

The 2nd most significant action that individuals can do to save the planet is to **live car free.** (See Illustration last page)

Use electric vehicles where a vehicle is needed, but replacing gas powered cars with electric cars is not the answer. Reasons:

- electric cars still require energy – we need to reduce energy use
- may need to build extra generating capacity if everyone moves to electric car
- cars take up public space that should be devoted to people

- they require roads- with much fewer cars, can have narrower streets, and more pedestrian friendly places to live and work
- requires the mining of materials and minerals – e.g. copper, lithium. Mining alone takes energy and releases GHG from the soil; and mining for metals and minerals causes environmental damage such as contamination of ground water.

DENSITY THAT SUPPORTS CAR FREE LIVING

Density where people can:

- walk to shops, work, bus stops, etc (also the necessary infrastructure e.g. sidewalks, local connectivity)
- bike to shops, work, etc
- access frequent bus service – short walk to the bus stop
    - according to some articles most people will walk up to ¼ mile (approx half a kilometer) to a bus stop -roughly a five minute walk;

May mean:

- shorter distances between homes
- smaller lots
- different mix of housing – more semi detached, stacked townhouses, three to six story apartment buildings

Still Need to Provide the Necessary Amenities

- green space – but now geared more to 'common' (shared, public) green space than private green space – more equitable; better for the environment (even common green spaces such as parks and trails within an urban area are better for the environment than personal yards)
- one's private outdoor space (balconies, back deck, small yards)

Avoid Development of Green Fields

Other climate emergency/environmental benefits from protecting 'green fields' from being developed:

- protects water sources/quality/quantity, and provides for heavy rain management
- protects the ecosystem, meaning all the bugs, microbes, animals, bees, etc important to sustaining our ecological systems;
- protects farmland needed for food; and other green land for community gardens
- protects trees, forests from being taken down – with all the environmental benefits they provide
- provides green space for the mental and physical health of all it citizens – through 'common' green space that everyone can easily access

EXAMPLES OF DENSITY IN DEVELOPMENTS UNDERWAY IN COBOURG

The following chart shows the different densities in Cobourg's Official Plan. Residential land use areas receive designations with different density targets e.g. Stable Residential Areas; New Residential Areas; High Density Residential Areas.

Greenfield developments have their own 'Secondary Plans' with density designations, e.g. New Amherst Community Secondary Plan; Cobourg East Community Secondary Plan, which are considered 'Green Field Developments.

Official Plan Densities (net area)	Hectare		Acre	
	Min	Max	Min	Max
Low Density	12	20	5	8
Medium Density Maximum building height permitted: for 'Stable Residential areas: 3 storeys; for 'New Residential areas' 4 stories	20	50	8	20
High Density Maximum building height: 6 storeys	50	100	20	40
Greenfield Development: minimum gross density target	35 persons and jobs/ha (13 persons and jobs/acre)			
Overall population density of Cobourg (pop/land area)	8.7 persons/ha (3.5/acre)			

To Support Roof Solar: to avoid trees and other structures shading house roofs density may need to be limited to 100 units per net ha (40 units/acre). Research is needed on this.

Examples of the target density of specific developments compared to requiring higher densities: (Note: some in 'net', some in 'gross'; to calculate units into persons, Cobourg appears to multiply units by 2 to 2.5).

1. '***Existing Community Structure'*** designation in the Official Plan (OP). Low density designation, where 'intensification potential would be modest and incremental"

   Cedar Shore: West end of Cobourg; Pebble beach area. 15 units on 2.7 net Ha – i.e. 6 units/net Ha. (2.5 units/acre)
   - If the Town required medium density:
     - 20 units/ha the minimum: 54 units/ha (22 units/acre) would be built there (add'l 39 units)
     - 50 units/ha the maximum: 135 units/ha (65 units/acre) could be built there (add'l 120 units)

   Clyde Street: running west off Ontario Street, not far from the lake – four large lots on the south side. Site estimated to be approx 1.5 net ha = 2.6 units/ha (1 unit/acre)
   - If the Town has required medium density:

- 20 units/ha minimum: 40 units/ha (16 units/acre) on this land
- 50 units/ha max: 100 units/ha (40 units/acre) on this land

If these two sites were built with significantly higher density, more people could enjoy the lake (equity issue); increase in support to downtown businesses; reduce need for Greenfield development; more people could walk and bike to services downtown.

2. ***Greenfield Development*** designation: (each have their own secondary plan)

   Village East Phase 5. 11.87 Ha (29.33 acres); 334 units. The average density in the current design is 28 units/gross ha (11.33 units/acre) *(70 persons/gross ha or 28 persons/gross acre)*
   - If the average density was 50 units/ha, **could reduce development area by almost half.**
   - The OP states that no more than 65% of the dwelling units can be low density.

   West Park – Canadian Tire lands (Van Dyke): 3 Ha; 72 units; average density is 23 units gross ha (9 units/acre) *(50 persons and jobs/ha or 20 persons/jobs/acre)*

3. New Amherst:
   – Neighbourhood General: net densities 12 to 37 units/ha (5 to15 units/acre)
   – Neighbourhood Centre: net densities 37 to 60 units/ha (15 to 24 units/acre)

WHAT DENSITY SHOULD COBOURG MOVE TOWARD

This is a difficult question, and one that needs more research than I have done. Here are some excerpts from different documents, some more dated than others, which means it may not reflect the global heating situation. It will be interesting to see what the recent "Official Plan and Climate Change Integration Workshop" held by the Clean Air Partnership conveyed on this topic.

Here is a chart that reflects the below. That they use three different units makes it more difficult.

	Hectare	Acre
No. 1: Essex Design Guide – dwelling units (2018)	115	46
No. 2: US Puget Sound - activity units – residents plus employees (2015)	111-123	45-50
No. 3: Dr. John Holtzclaw – persons and dwelling units (1986)	30 -40	12-16

1. The existence of a substantial and compact residential and business community within easy walking distance of an urban or neighbourhood centre is the principal platform for sustainable development. This catchment (at least 5000 people for a typical, sustainable neighbourhood) can support a bus route and a variety of shops

and services, and can attract other commercial investment. It requires an average neighbourhood density of at least 65 dwellings per hectare with higher density towards the centre of the neighbourhood (or town centre, transport corridor etc.). This allows for lower densities towards the margins of the neighbourhood.

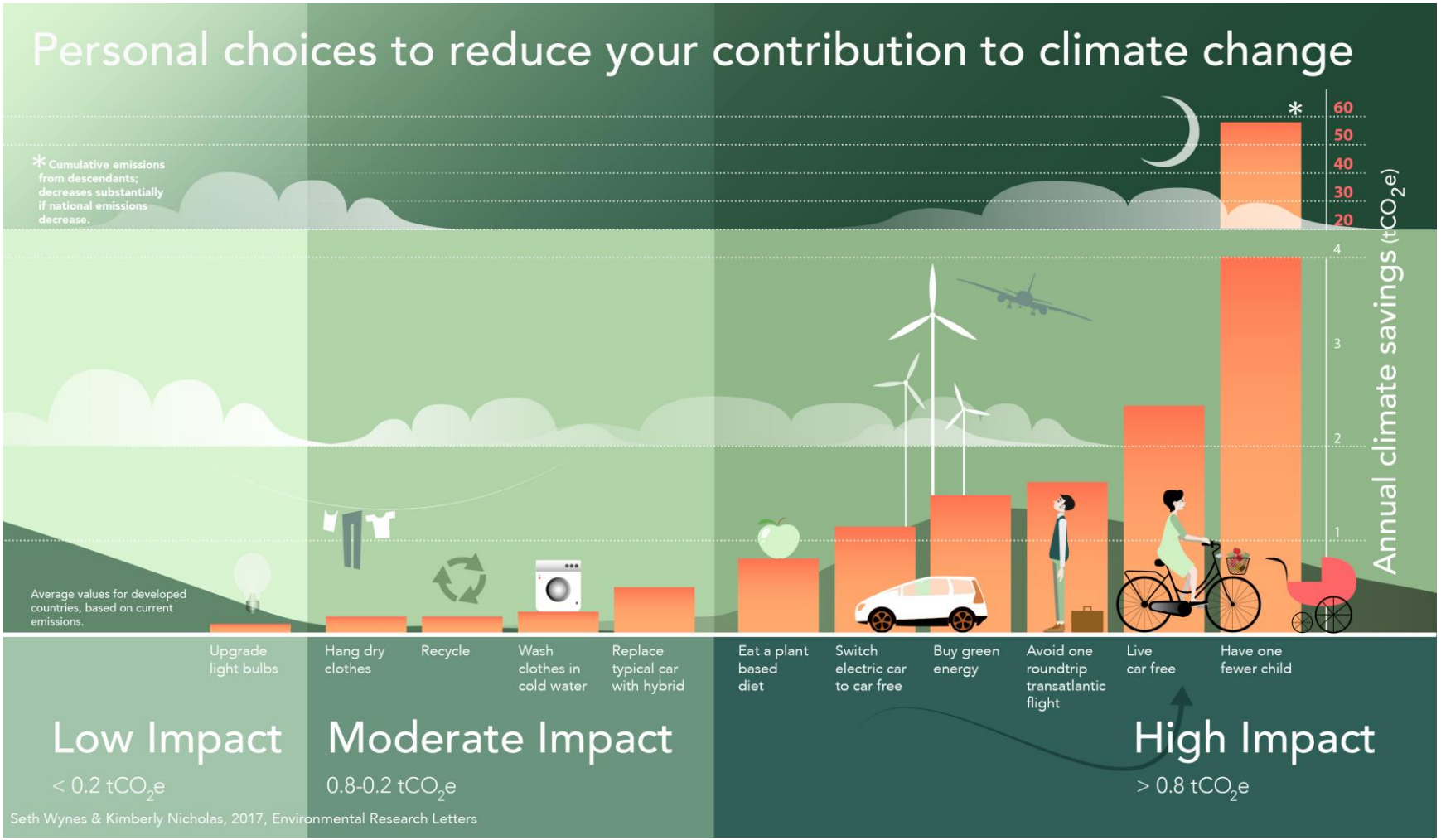
Sample Calculation:
No. of apartments: 210
No. of houses: 25

Non-residential space with residential use above:
Community use (150 ÷ 75 sq m) = 2
Commercial use (3750 ÷ 75 sq m) = 50

Total 287
Net site area = 2.5 ha
Development density = 115 dwellings per hectare (46 dwellings/acre)
https://www.essexdesignguide.co.uk/design-details/layout-details/densities-for-sustainable-development/ Densities for Sustainable Development, 2018, The Essex Design Guide,

2. Significant transit ridership gains begin when density surpasses 30 activity units (residents plus employees) per gross acre (74 activity units per ha); most significant gains in ridership occur when densities exceed 45-50 activity units per gross acre (111 to 123 per gross ha)
Source: https://www.psrc.org/sites/default/files/tsdluguidancepaper.pdf *Transit-Supportive Densities and Land Uses, A PSRC Guidance Paper (February 2015) by US Puget Sound Regional Council.*

3. From their study of 32 major cities around the world, Peter Newman and Jeffrey Kenworthy (1989) report on a United Kingdom study…they recommend densities above 30-40 persons/hectare (12-16 persons/acre, 12-20 dwelling/res units/acre) for public transit oriented urban lifestyles.
https://vault.sierraclub.org/sprawl/articles/characteristics.asp Community Characteristics Promoting Transit and Walking, Dr. John Holtzclaw, updated March 2007


Personal choices to reduce your contribution to climate change
* Cumulative emissions from descendants; decreases substantially if national emissions decrease.
60
50
40
30
20
4
3
2
1
Annual climate savings (tCO2e)
Average values for developed countries, based on current emissions.
Upgrade light bulbs
Hang dry clothes
Recycle
Wash clothes in cold water
Replace typical car with hybrid
Eat a plant based diet
Switch electric car to car free
Buy green energy
Avoid one roundtrip transatlantic flight
Live car free
Have one fewer child
Low Impact
< 0.2 tCO2e
Moderate Impact
0.8-0.2 tCO2e
High Impact
> 0.8 tCO2e
Seth Wynes & Kimberly Nicholas, 2017, Environmental Research Letters