

Getting Serious about Sustainability: Exploring the Potential for One-Planet Living in Vancouver

Jennie Moore, Associate Dean, BCIT School of Construction and the Environment

One-Planet U Vic.,

Bateman Centre for the Arts

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Vancouver

- Reputation as a sustainable city
- Ecological footprint on par with most high-consuming cities
- Schism between perceptions and facts?

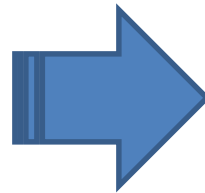


Urban Living in the Anthropocene

50% of net primary
production in
service of human
population



50% of global
population lives in
cities



Our Planet



Bio-Capacity

Urban
Impact

Economy

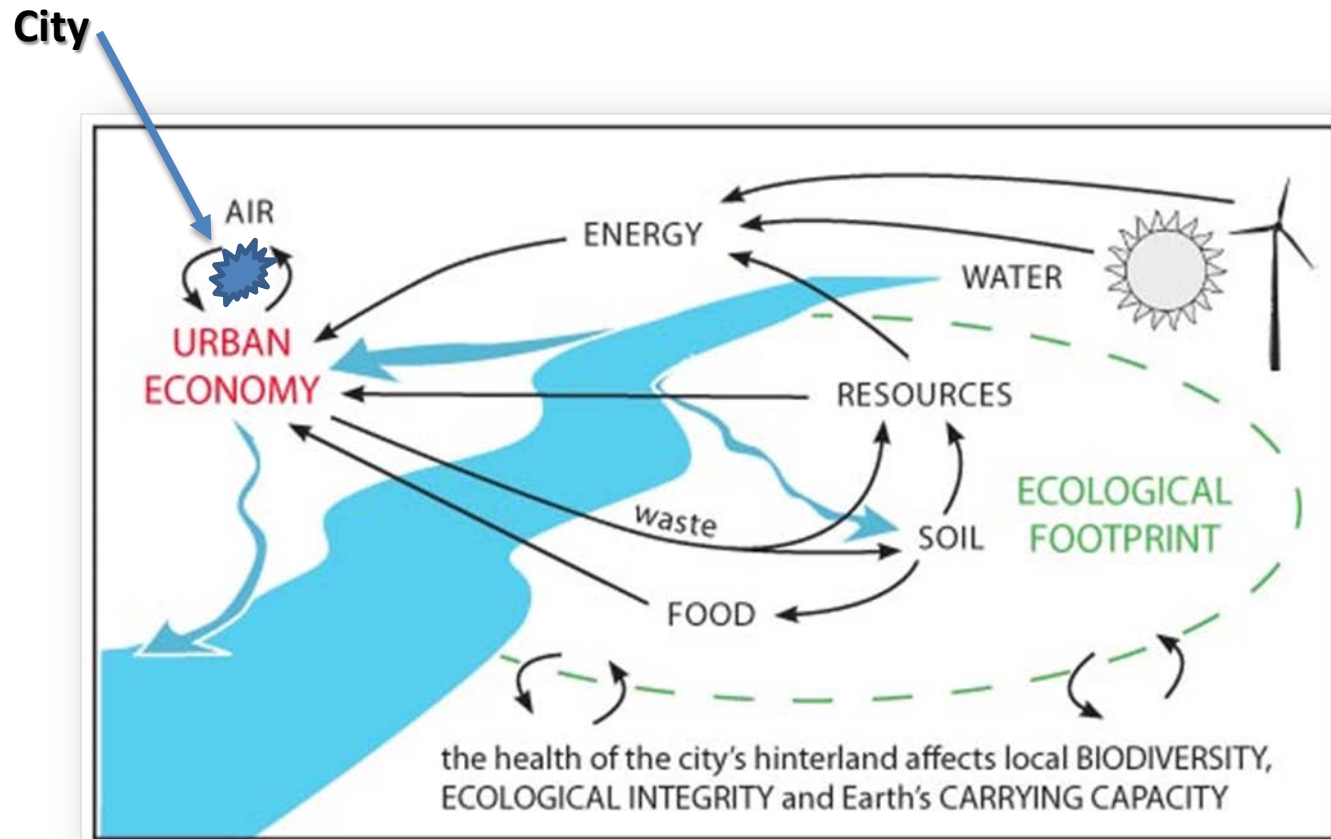
Built Environment

Consumption

Lifestyles



Understanding Urban Ecosystems



Ability to Measure Impact on Urban Ecosystems

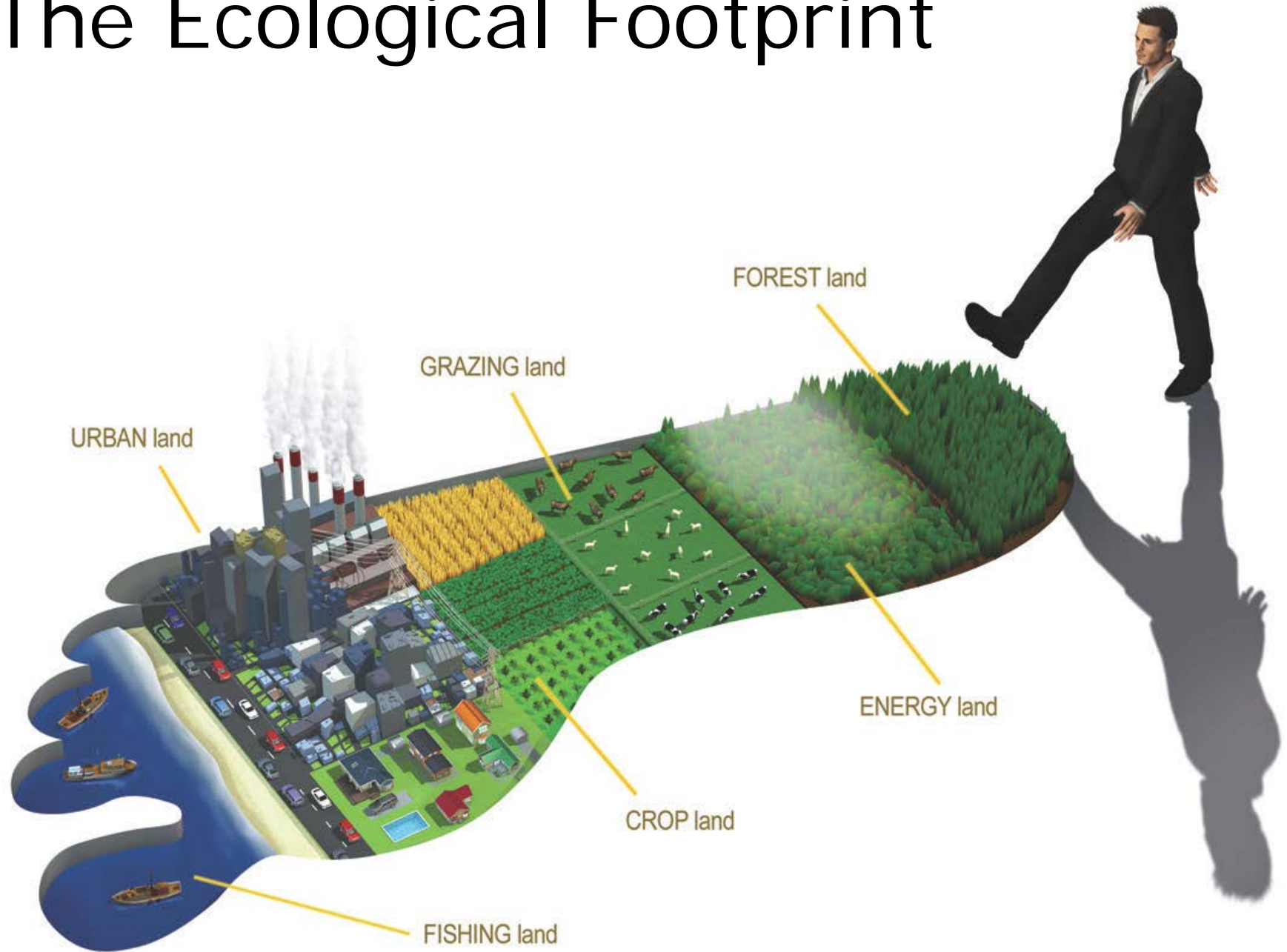
Natural Capital only source of true production

- Natural capital refers to a stock of ecosystem assets that yield ecological goods and services (Neumayer 2003).



- e.g., photosynthesis and pollination to produce food, fuel and fibre
- e.g., evaporation and transpiration to produce rain and fresh water

The Ecological Footprint



Biocapacity = Net Primary Production

Approximately 1.7
gha/ca



11.96 billion
hectares of
ecologically
productive land
and sea area
(WWF 2014)

7.3 billion
people

Definition of One-Planet Living

- One-planet living refers to a lifestyle that, if adopted by everyone, could be supported indefinitely by the regenerative capacity of Earth's ecosystems (Wackernagel and Rees 1996)
- It uses the ecological footprint as a metric, and is currently estimated at 1.8 gha/ca (James and Desai 2003).

Vancouver Greenest City 2020 Action Plan

	Zero Waste	Green Economy	Lighter Footprint
Climate and Renewables			
Green Buildings			
Green Transportation	Healthy Ecosystems		
Clean Air			
Clean Water			
Local Food			
Access to Nature			



Lighter Footprint Goal



Vancouver leadership in working with Ecofootprint and committing to reducing it!

KEY STRATEGIES TO 2020

Measure and report

Report on the progress and highlight the successes from implementing the other nine *Greenest City 2020 Action Plan* goals. This will help to maximize the potential footprint reductions.

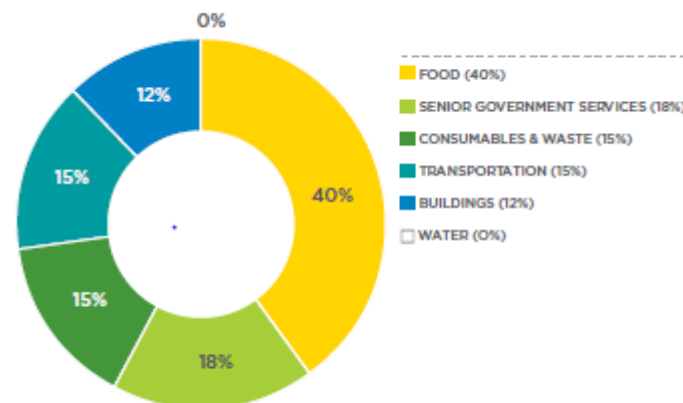
Engage, encourage, and enable

Engage and support residents, businesses, non-profits, and other community members to work together to create diverse lighter footprint solutions.

Exemplify

Demonstrate lighter footprint actions and choices in City operations such as parks and community centres and in City services such as garbage collection, street maintenance, and special events.

What's in Vancouver's ecological footprint?



SOURCE: Using data from J. Moore, 2011 (in progress).

Footprint data encompasses consumption-based emissions inventory equivalent to scope 3.

Why Measure Consumption

Tell the whole truth about lifestyle impacts



Inspire people to act on what they can change.



Link policy to footprint outcomes



Leverage city initiatives through engaged citizenry.



Report on Scope 3 emissions

Two Methods

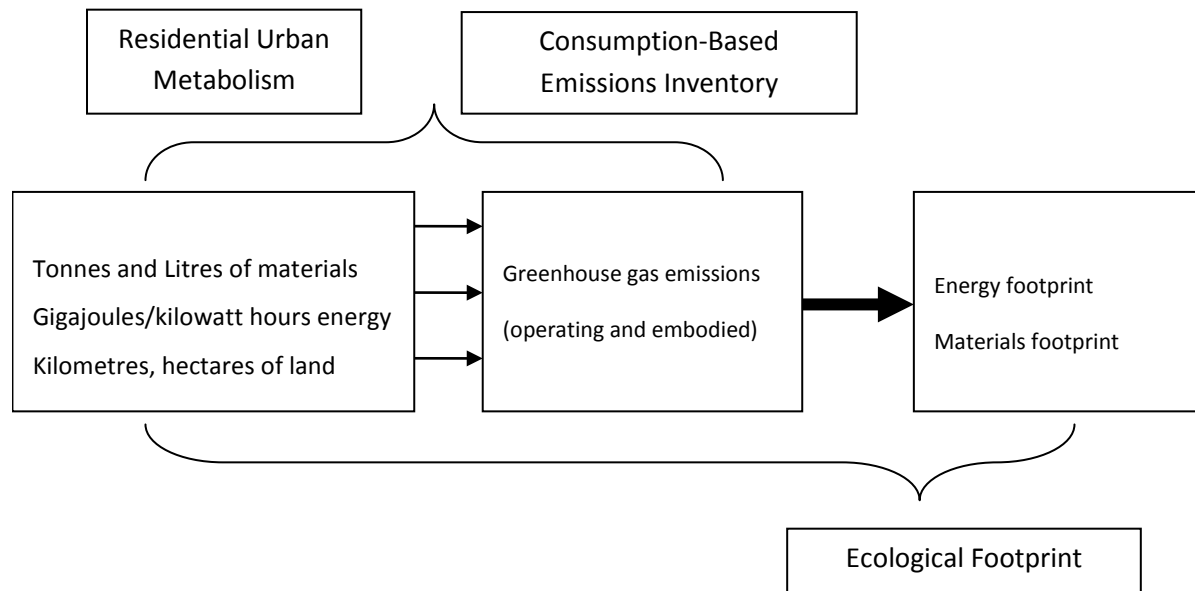
COMPOUND Method

- Top-down
- National data
- Input-Output economic tables
- <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/trade26-eng.htm>
- <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/met01/met130-eng.htm>
- Comparable
- Comprehensive
- Not locally responsive

COMPONENT Method

- Bottom-up
- Local data
- Municipal and Regional reports
- <http://vancouver.ca/files/cov/greenest-city-action-plan-implementation-update-2014-2015.pdf>
- http://www.metrovancouver.org/services/regional-planning/PlanningPublications/Farming_In_Metro_Vancouver_Oct_2014.pdf
- <http://www2.gov.bc.ca/gov/content/environment/climate-change/reports-data/community-energy-emissions-inventory>
- Not comparable (as a rule)
- Significant data gaps
- Locally responsive/relevant

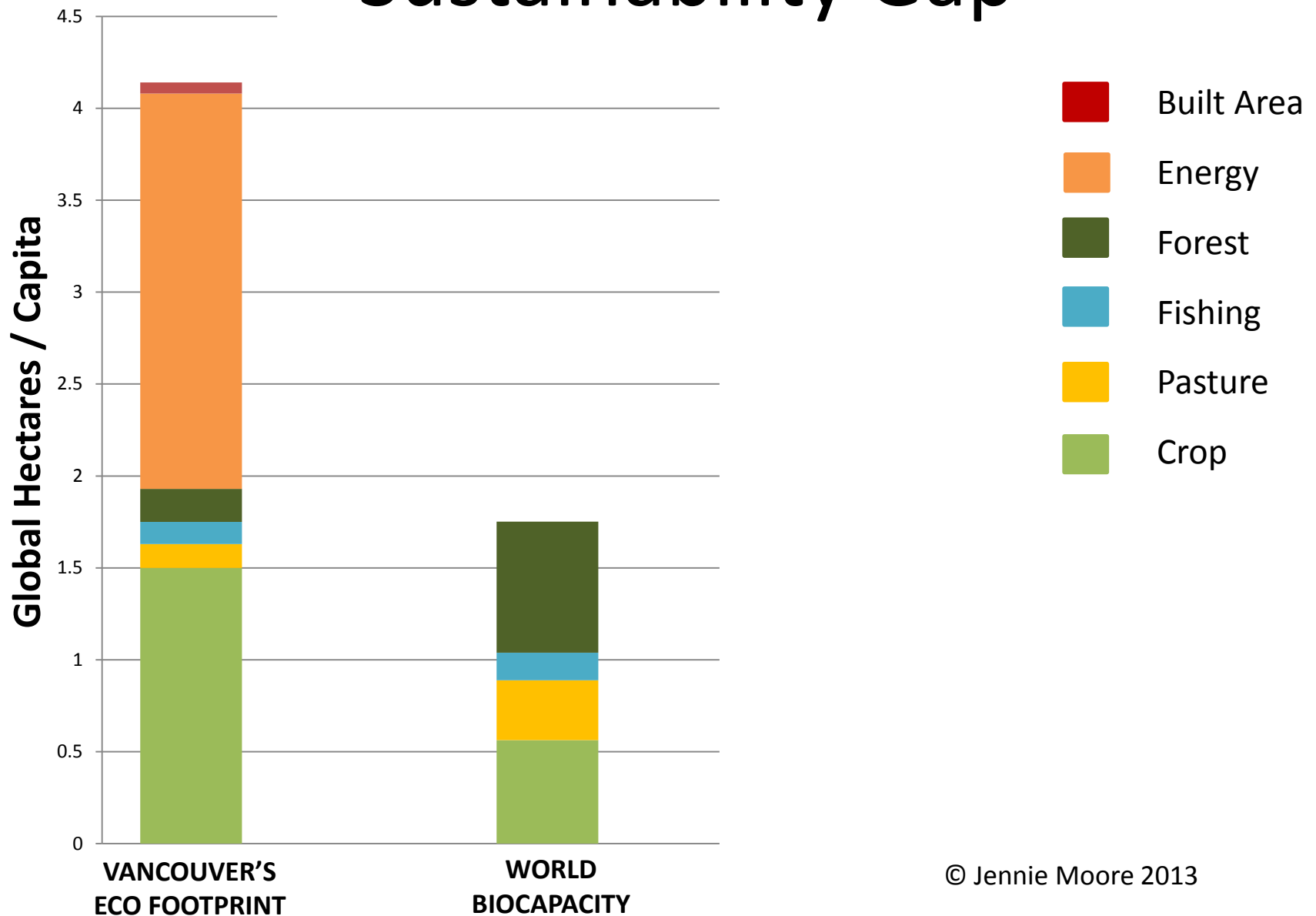
Component Method: *integrated urban metabolism, consumption-based inventory, eco-footprint*



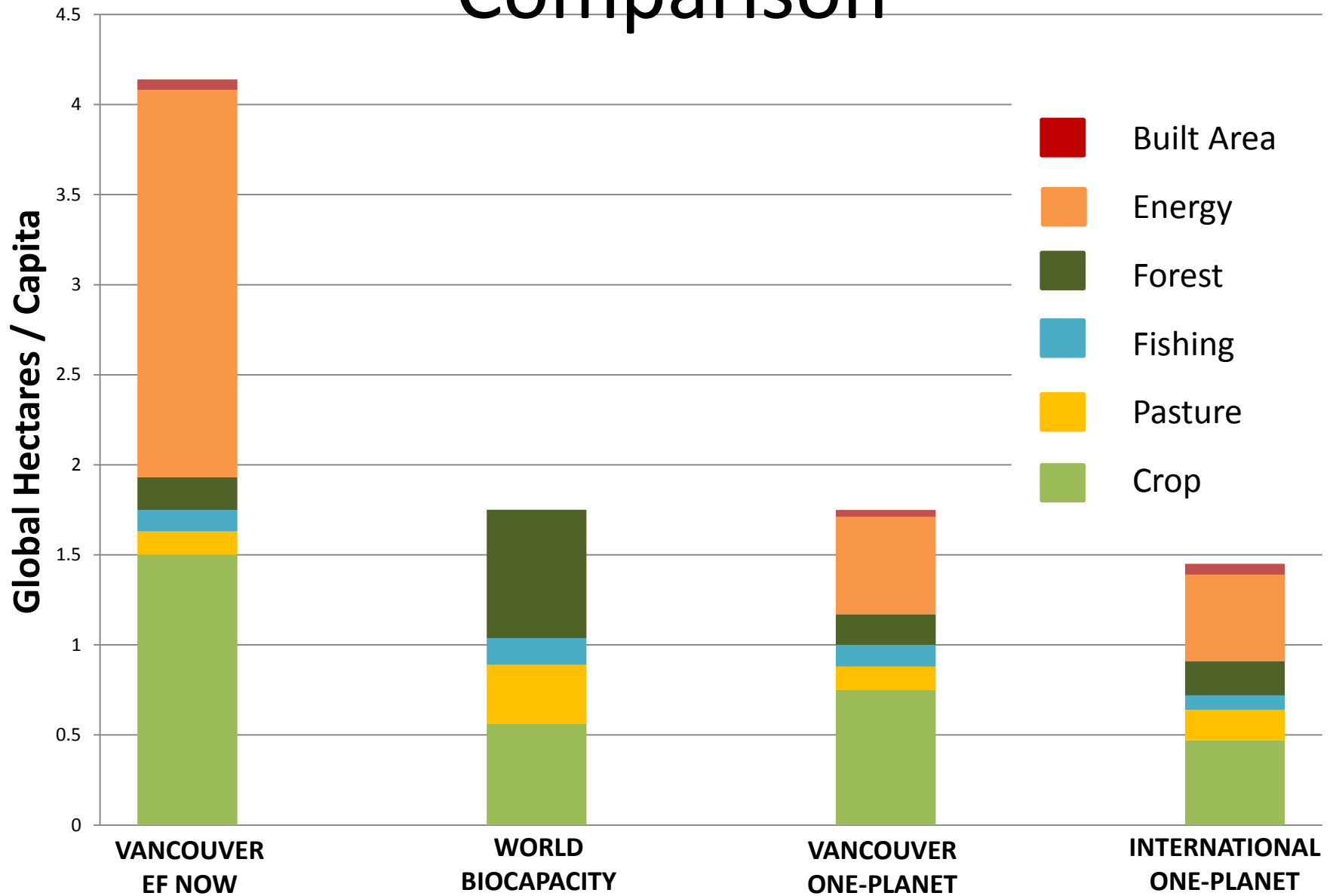
Vancouver's Ecological Footprint

- Vancouver ecological footprint 2,430,476 gha
(an area 212 times larger than City itself)
- Vancouver per capita footprint = 4.21 gha/ca
(with senior government services = 4.97 gha/ca)
- Need to reduce EF by 58% to close sustainability gap

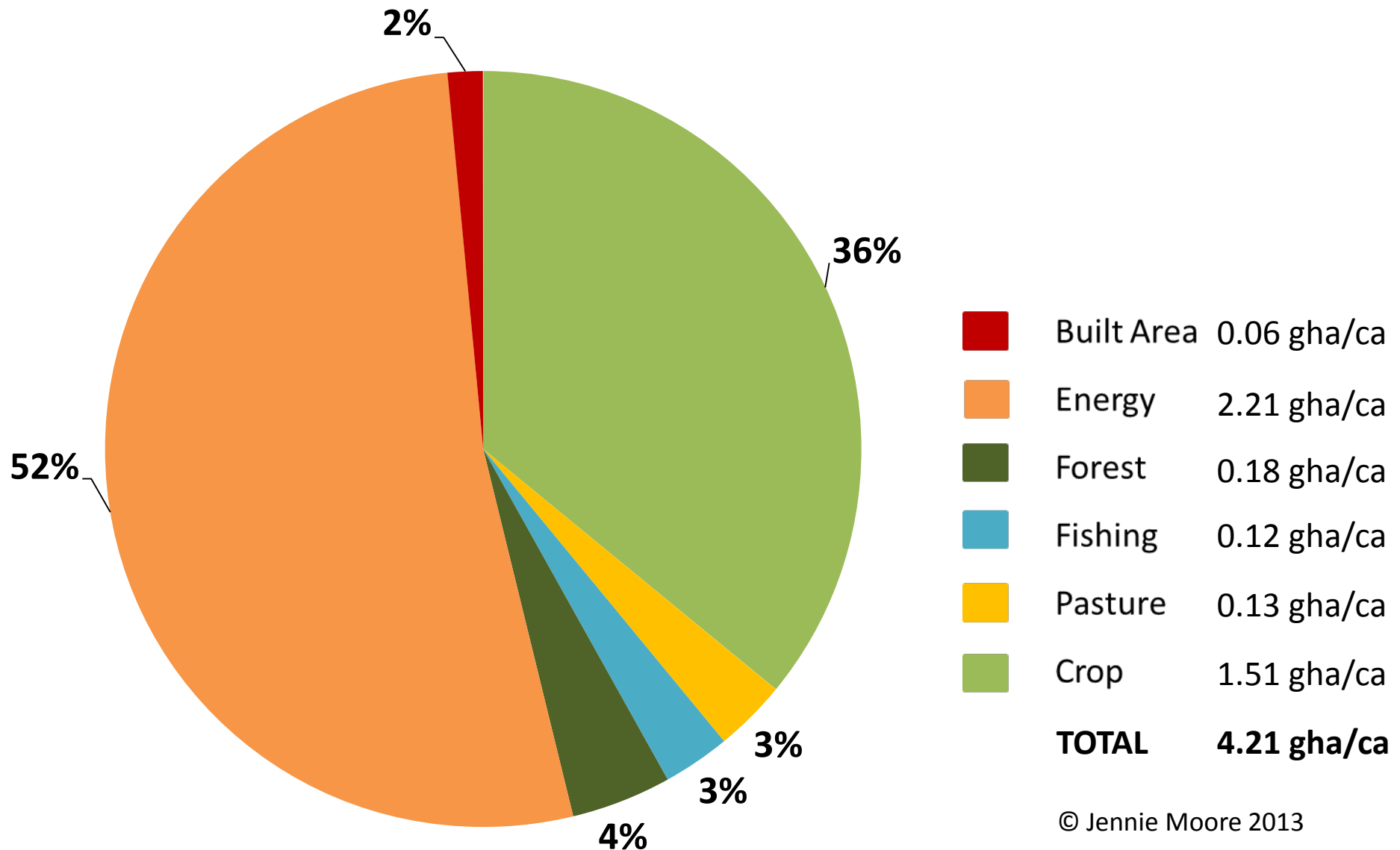
Sustainability Gap



Comparison

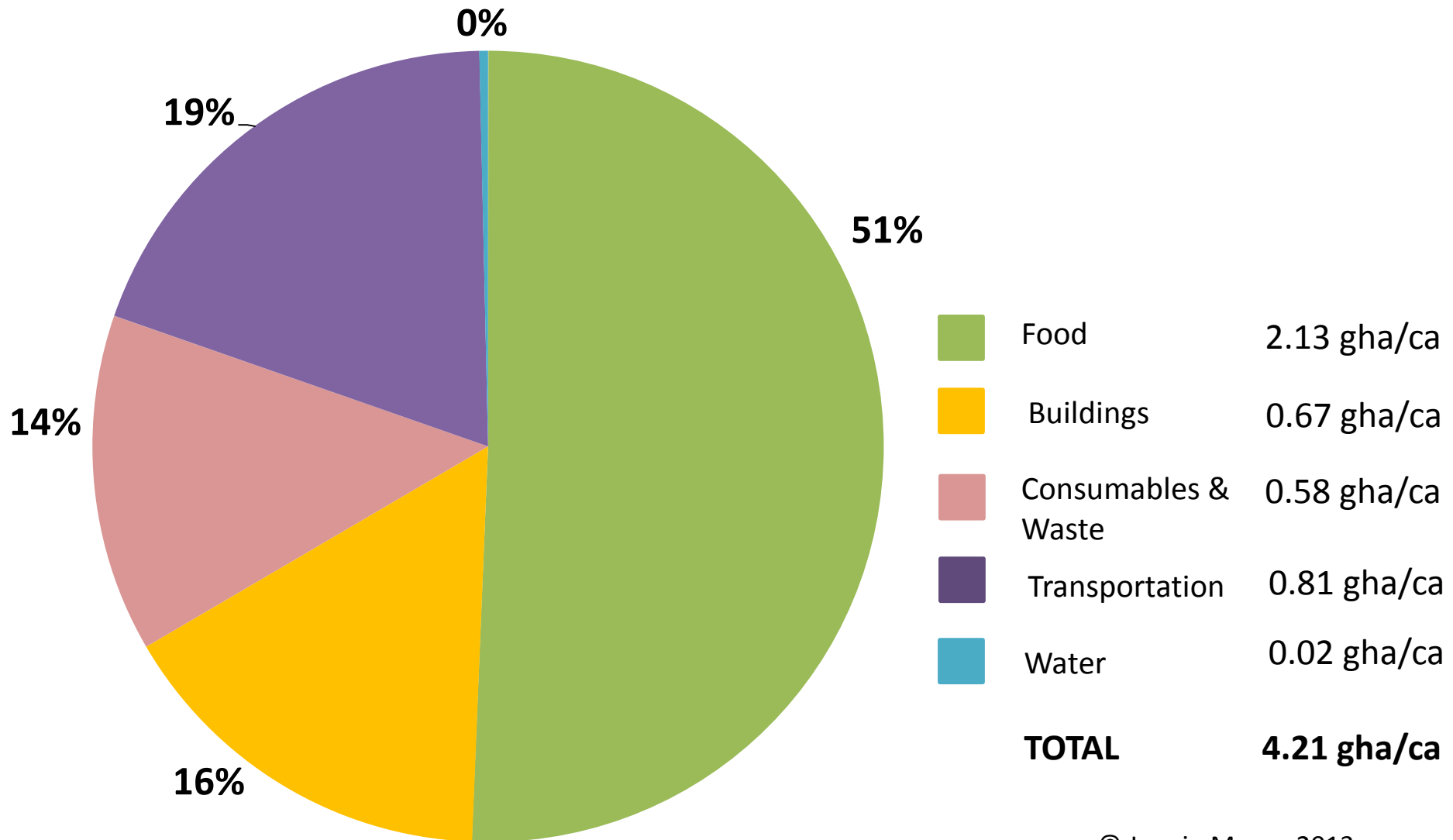


Vancouver's Ecological Footprint By LAND USE

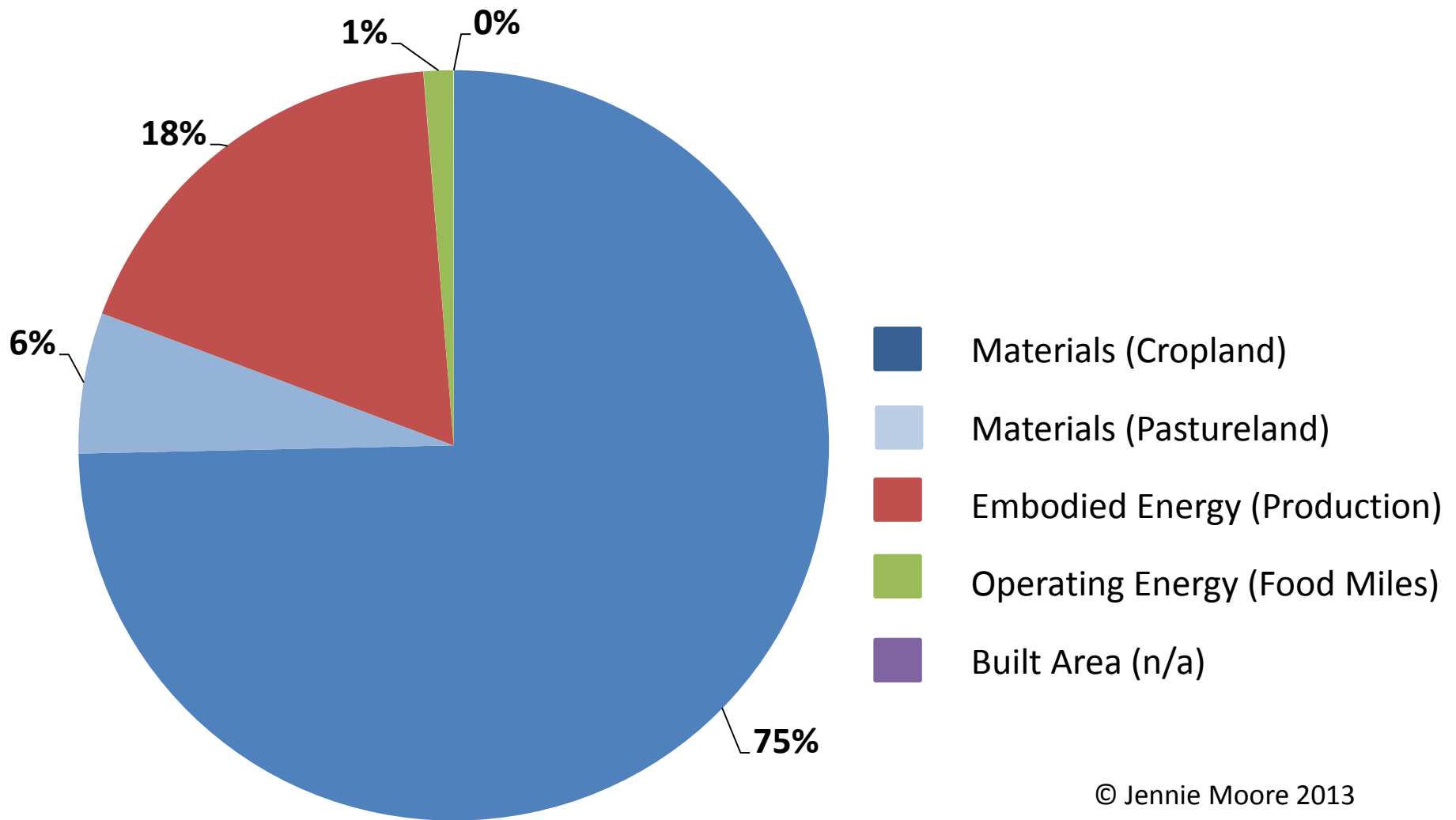


Vancouver's Ecological Footprint

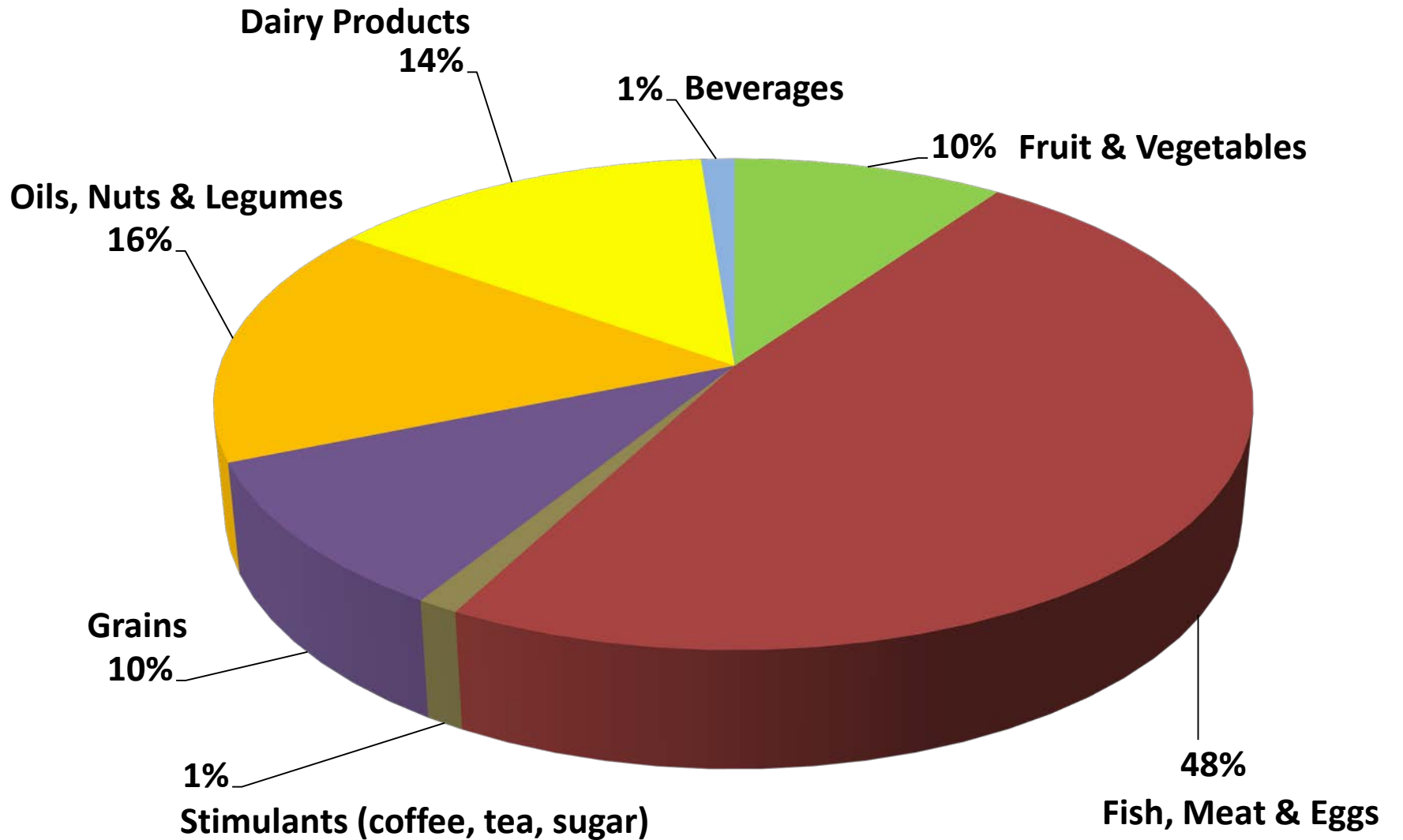
By ACTIVITY



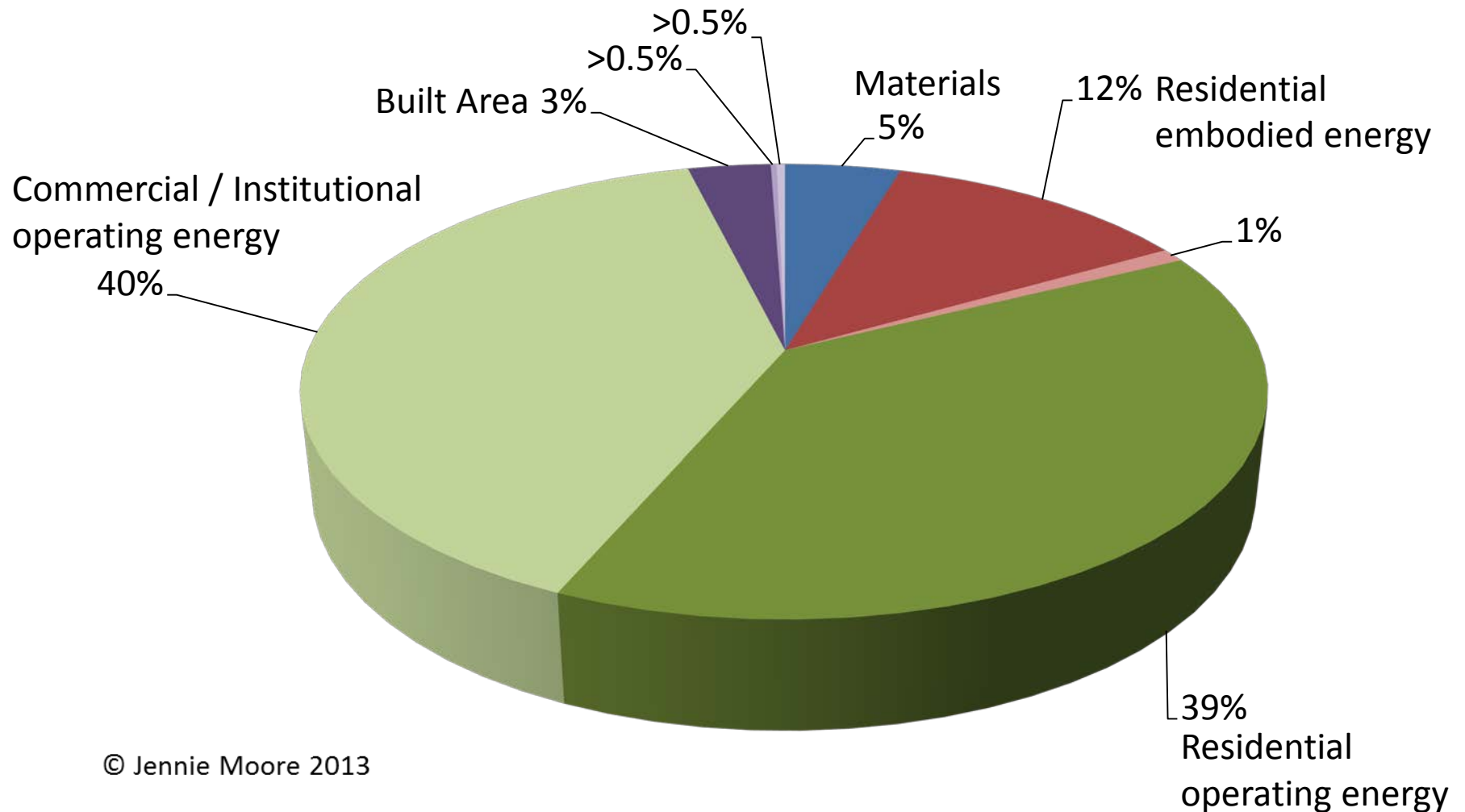
Food Footprint (2.13 gha/ca)



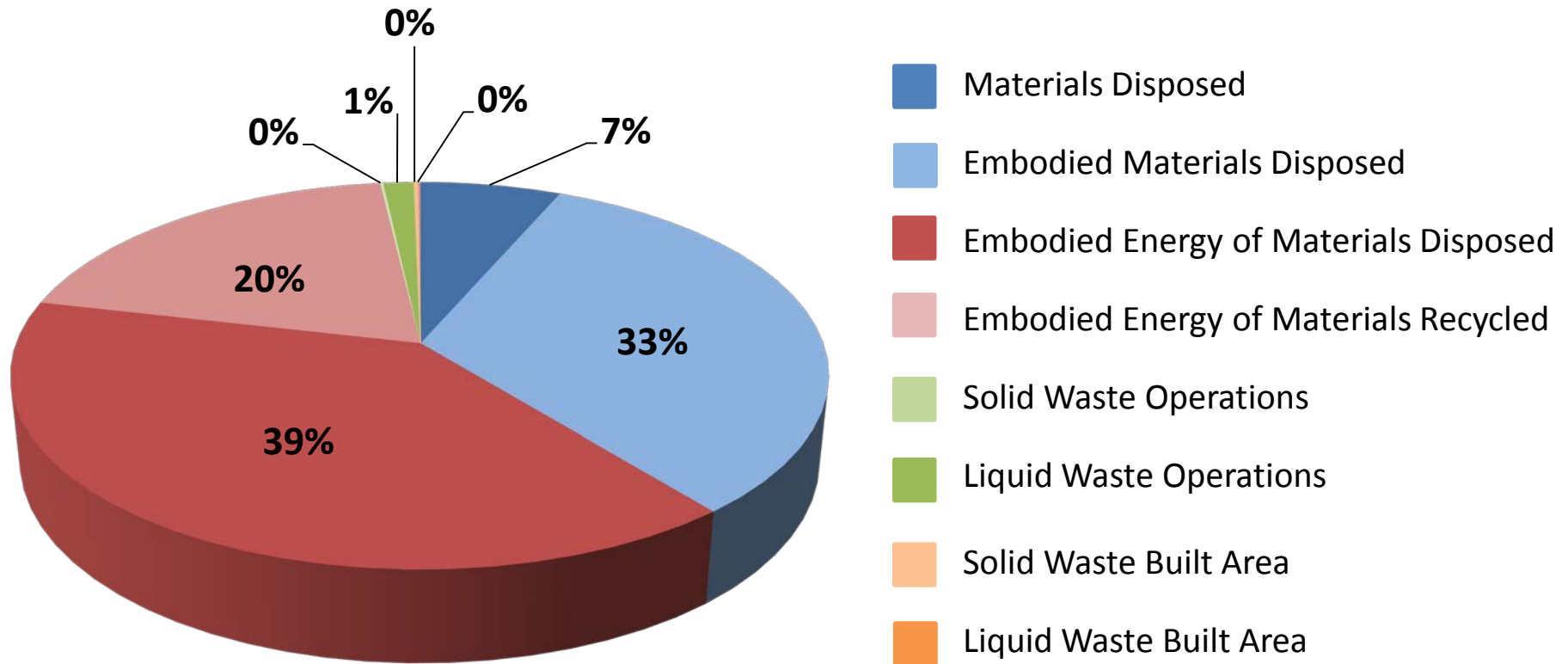
Food Footprint by TYPE (2.13 gha/ca)



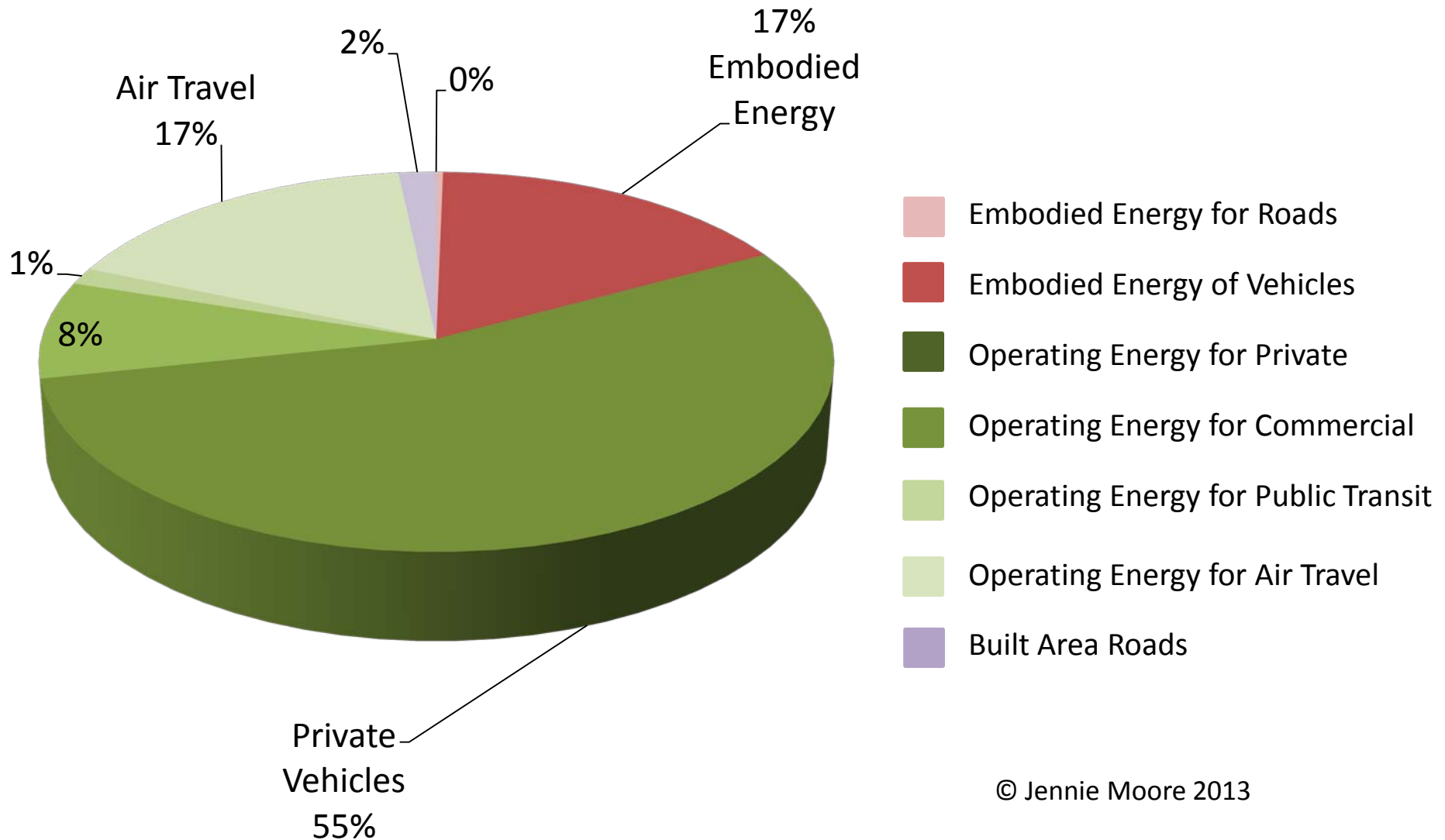
Buildings Footprint (0.67 gha/ca)



Consumables and Waste Footprint (0.58 gha/ca)



Transportation Footprint (0.81 gha/ca)



Assumptions vs. Analysis

Vancouver 2020

- Reduce GHGs 20%
- Improve building energy efficiency 20%
- Over 50% of trips by walking, cycling, transit
- Reduce waste to landfill by 40%

One Planet

- Reduce GHGs by 80%
- Improve building energy efficiency 60% and triple density
- 100% trips by walking, cycling, transit
- Reduce consumption by 45%

Assumptions vs. Analysis cont.

Vancouver 2020

- Plant 150,000 trees
- Reduce Ecological Footprint by 33%
- Reduce water consumption by 33%
- Meet or beat WHO air quality guidelines
- Reduce carbon content of food 33%

One Planet

- Plant 750,000 (more?)
- Reduce Ecological Footprint by 61%
- N/A
- N/A
- Reduce carbon content of food 50% and change diet

One-Planet Baseline

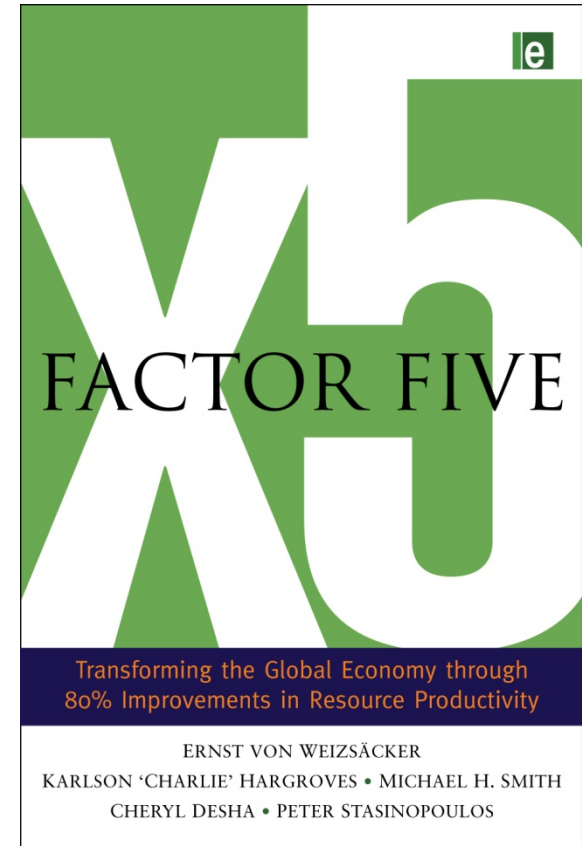
Top five actions include:

1	Make 86% of trips by walking, cycling and transit	0.38 gha/ca
2	Reduce food waste post-purchase by 50%	0.37 gha/ca
3	Reduce red meat consumption 50% by substituting with white meat or legumes	0.34 gha/ca
4	Improve energy efficiency in buildings by 40%	0.21 gha/ca
5	Reduce paper consumption by 50%	0.12 gha/ca

One-Planet Lifestyle?

- Repurpose, fix and share belongings
- Avoid consumption of paper, red meat and bottled beverages
- Roads, roofs, and walls used for urban agriculture
- Most trips (86%) are by walking, cycling and transit, vehicles are zero emissions
- Most people don't fly and very few own cars
- Buildings are energy efficient and zero emissions

Getting Serious About Sustainability

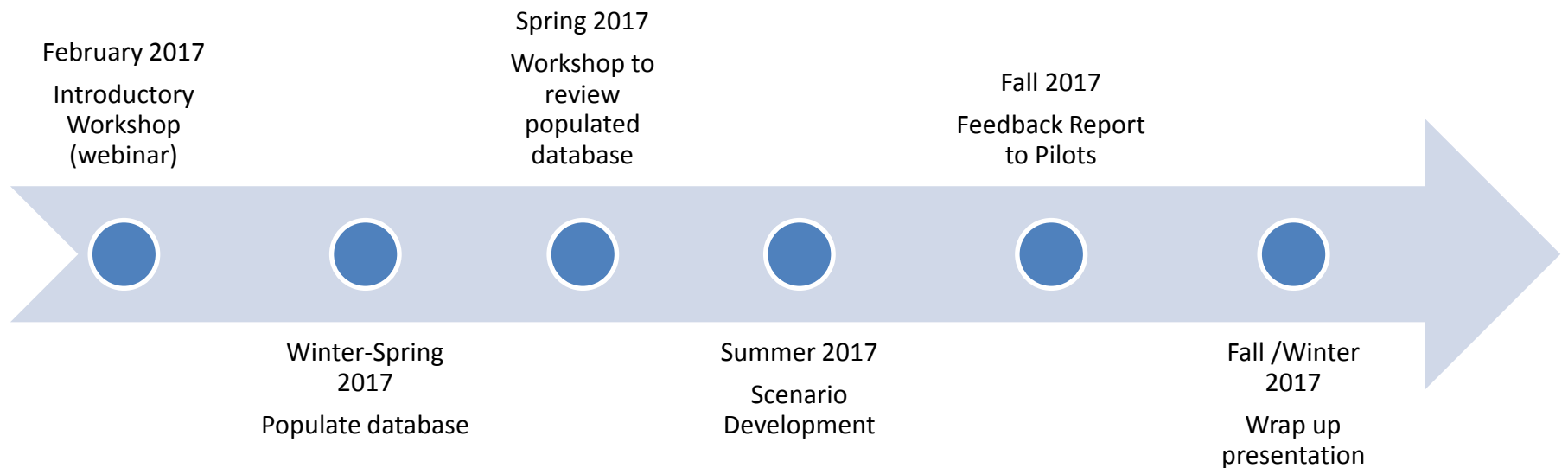


ecoCITY Footprint Tool

designed to integrate with International Ecocity Standards

- **Urban Metabolism**
 - Resource inputs
 - Flows of energy and materials
 - Waste outputs
 - Consumption patterns
 - Food and dietary choices
 - Dwelling size
 - Consumable goods
 - Vehicle ownership
 - Recycling rates
 - Lifecycle analysis
- **Consumption Based Emissions Inventory**
 - Scope three compatible
 - Facilitates embodied energy assessment
 - Capacity for scenario analysis
- **Ecological Footprint Analysis**
 - Evaluation and policy analysis capacity
 - Achieving One-Planet Living

Timeline for Pilot Project with City of Victoria



Thank You



School of Construction and
the Environment

*Concerned with the natural environment, the built environment,
and the relationship between them.*

Jennie_Moore@bcit.ca