Ryerson University

Housing Research and Initiatives

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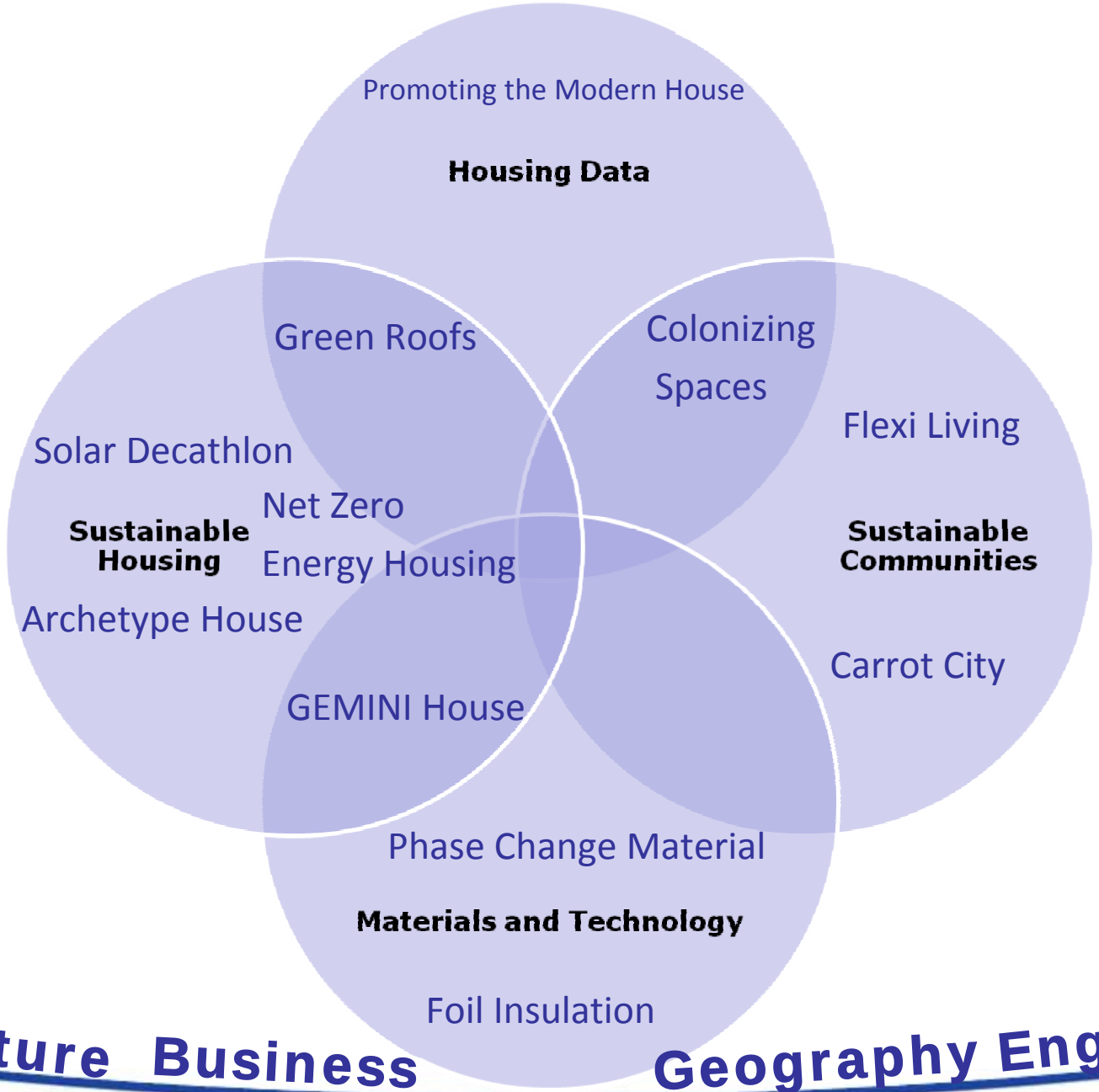

Architecture Business Geography Engineering

Ryerson Housing Research

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Housing Data

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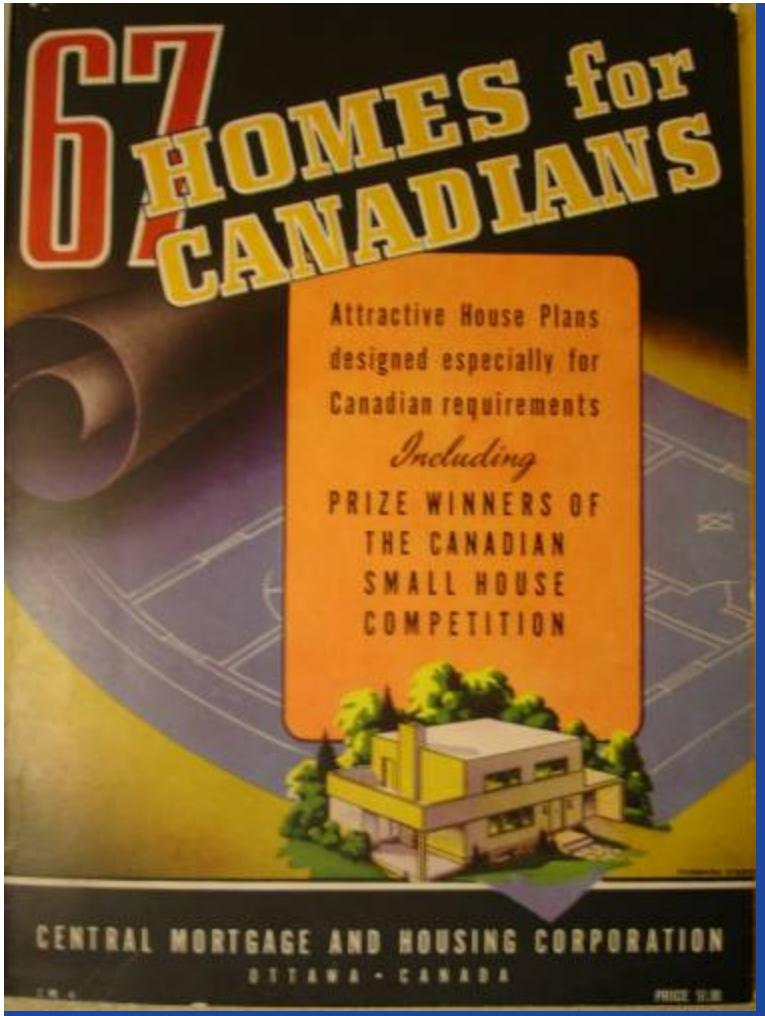

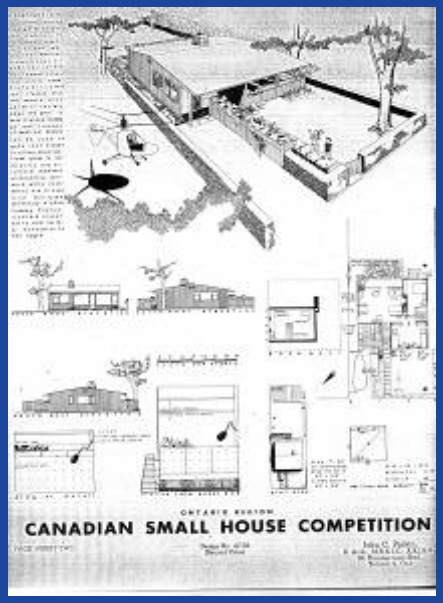

CMHC *Canadian Small House Competition*, Announcement, *Journal of the RAIC*, September 1946 / CMHC *67 Homes for Canadians,* CMHC, 1947 / *Journal of the RAIC*, January 1947 / *Canada's Prize-Winning Houses*, Canadian Homes and Gardens, February 1947

George Kapelos

The Small House in Print
Promoting the Modern Home to Canadians: 1946 – 1957

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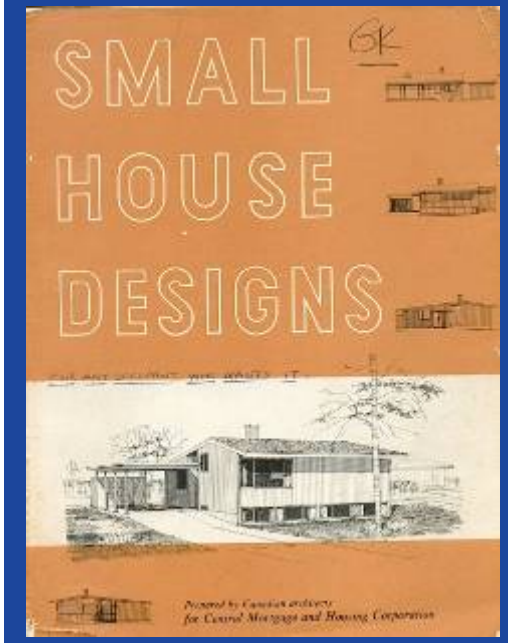

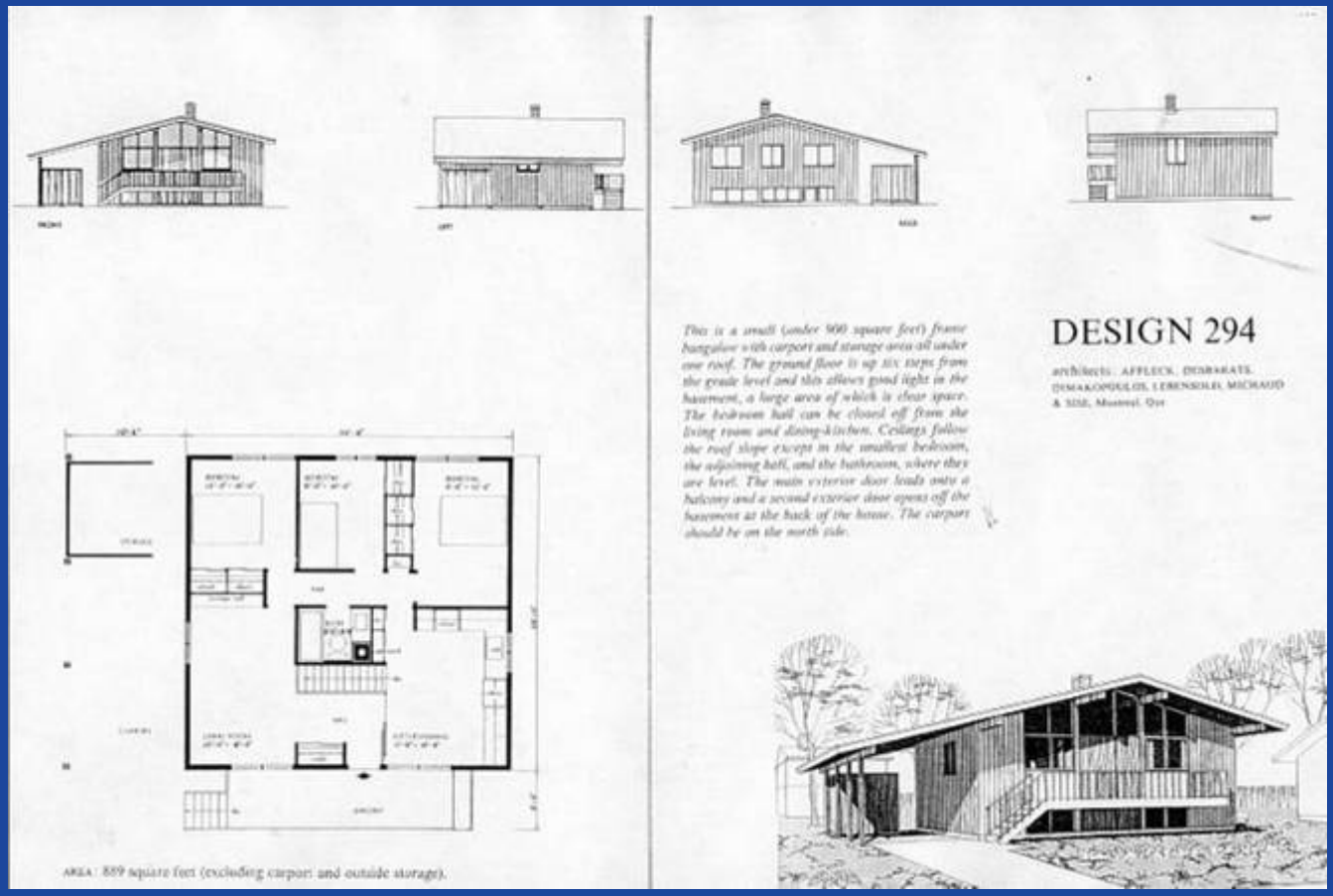

CMHC, *Small House Designs*, Design 294, Affleck *et al.* Architects, 1958

George Kapelos

The Small House in Print
Promoting the Modern Home to Canadians: 1946 – 1957

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- St. Jamestown

- Cabbagetown

- Regent Park

Dr. Doreen Fumia

Colonizing Spaces in Toronto's Downtown East Side: Three enclaves

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Shaping Neighbourhood Space: The Relationship Between Built Space and Human Geography

Shelter Bed closings, numbers of RGI housing eroded, rising prices and single family homes encouraged through Heritage Preservation

Taking it to the streets →

Resisting being pushed out by gentrifying projects

Dr. Doreen Fumia

Colonizing Spaces in Toronto's Downtown East Side: Three enclaves

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Greening From Above

Roofs as an Environmental Infrastructure Resource

Hitesh Doshi
Department of Architectural Science, hdoshi@ryerson.ca

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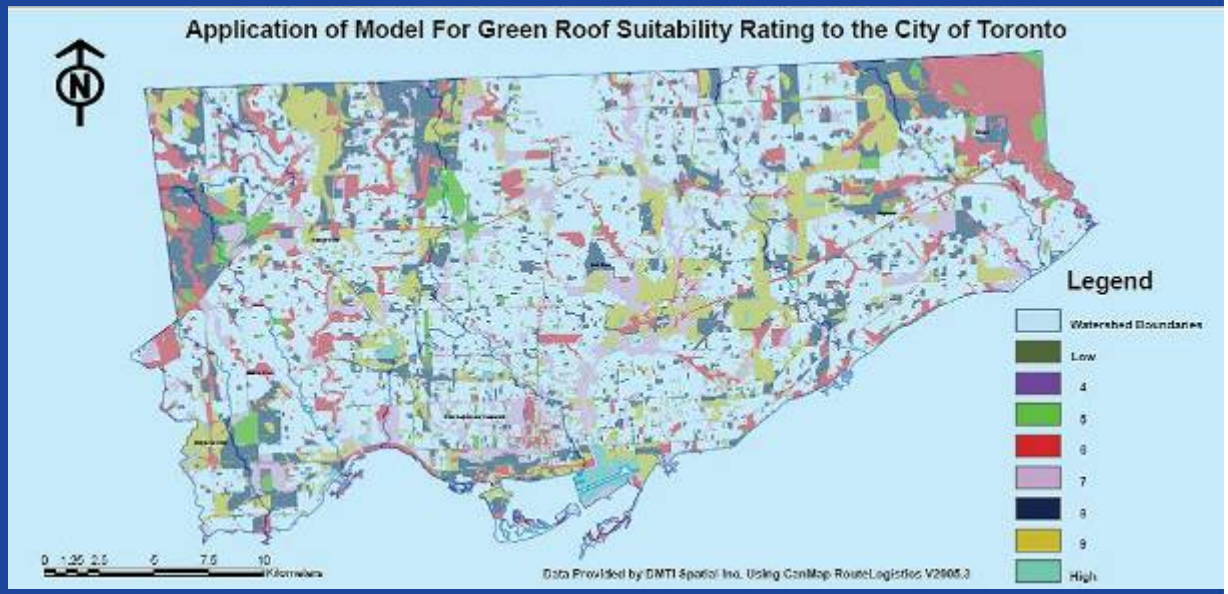
Research Focus

- Policy support
  - Standards
- Spatial Analysis
  - Suitability Analysis
  - Ranking
- Economic Analysis
  - Environmental and Ecological Considerations

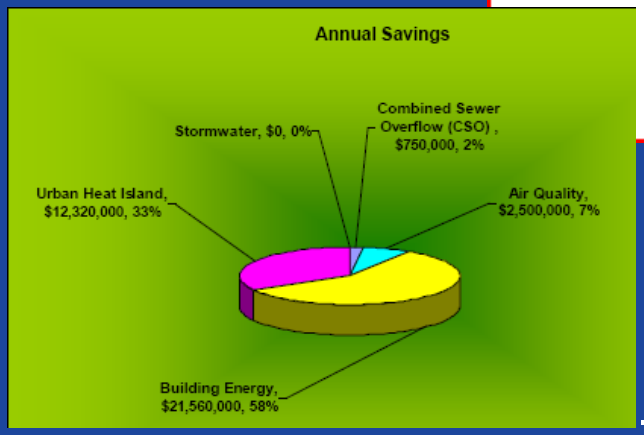


Environmental Economic Analysis

Report on the
Environmental Benefits and Costs of
Green Roof Technology for the City of Toronto

Prepared For

City of Toronto and
Ontario Centres of Excellence –
Earth and Environmental Technologies (OCE-ETech)



For more information:
http://www.toronto.ca/greenroofs

Hitesh Doshi

Greening From Above

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Institute of Housing & Mobility

Institute of Housing and Mobility (iHM) has been established in the Faculty of Business at Ryerson University to develop market-based solutions for housing and mobility challenges faced by Canadian businesses and households.

- Current research focuses on trade corridors and capacity constraints at seaports.
- Exploring the behavioural decision making of homebuilders and the transport and housing costs tradeoffs faced by households.

Dr. Murtaza Haider
School of Retail Management

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Sustainable Communities

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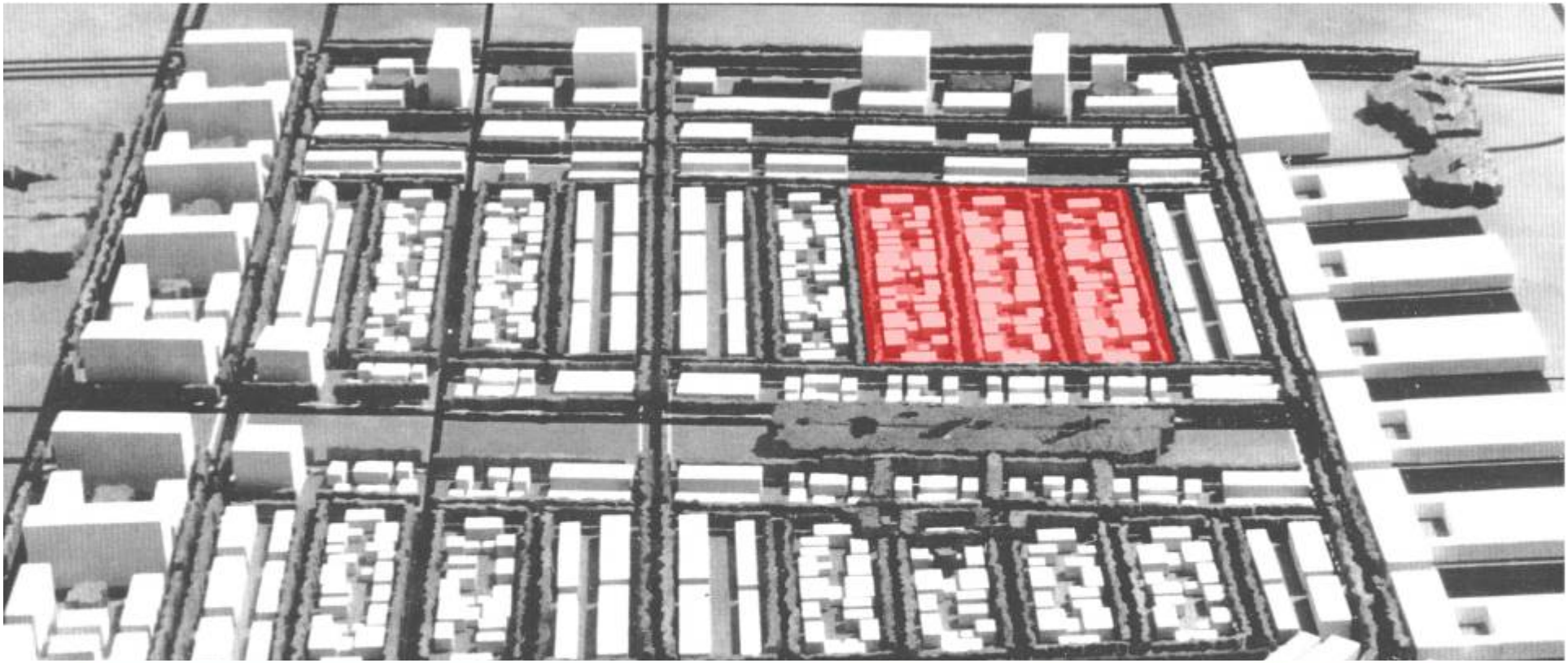

FLEXI living

Adaptable Property / Adaptable Housing / Transforming Lives

FLEXI living

Adaptable Property / Adaptable Housing / Transforming Lives

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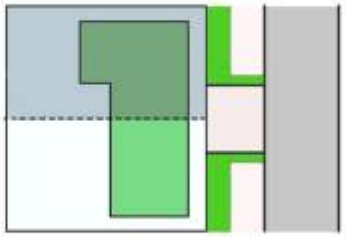


C-TYPE: CONVERTIBLE HOUSE

SINGLE-FAMILY DETACHED
300m2

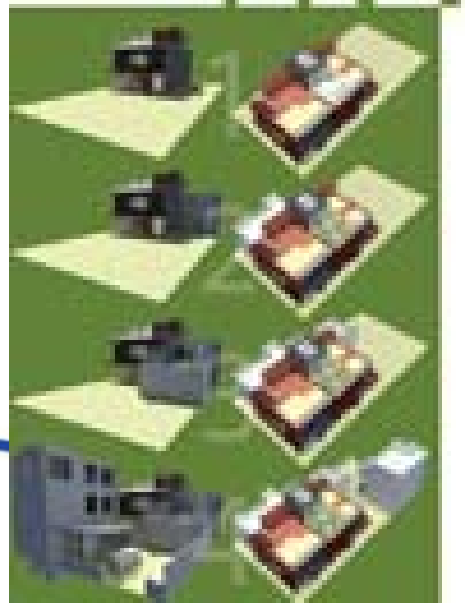
SEMI-DETACHED (3 STOREYS)
150m2

SEMI-DETACHED (2 STOREYS)
150m2

This 300 square meter, loft-like, live/work, detached dwelling situated on a wide and shallow lot accommodates a dedicated office and separately-accessed, above-ground, in-house apartment. Lot and house have the built-in potential of subdivision: the lot can be readily severed and the dwelling easily modified to generate a free-hold semi-detached, an ideal proposition for the empty-nester. One semi-detached unit is designed to readily accommodate living on one floor, ideal for the elderly.

REVALUING SUBURBIA AND THE DETACHED HOUSE

INHABIT



SUBURBIA IS UNSUSTAINABLE.

It is a matter of fact: simple as that. Therefore the proposal of a sustainable archeological suburban house is nonsense. It doesn't exist. A counter proof. There cannot be a sustainable single detached suburban house because the notion of a sustainable suburbia is a paradox.

Then what do we do? How do we approach this stunningly prevalent typology with an appropriate model for the near future? Our investigation leads us to take a step back and reformulate the question: if suburbia is inherently unsustainable, can there be a sustainable urbanism? If the single-detached house is excessive, then can the home be reinterpreted?

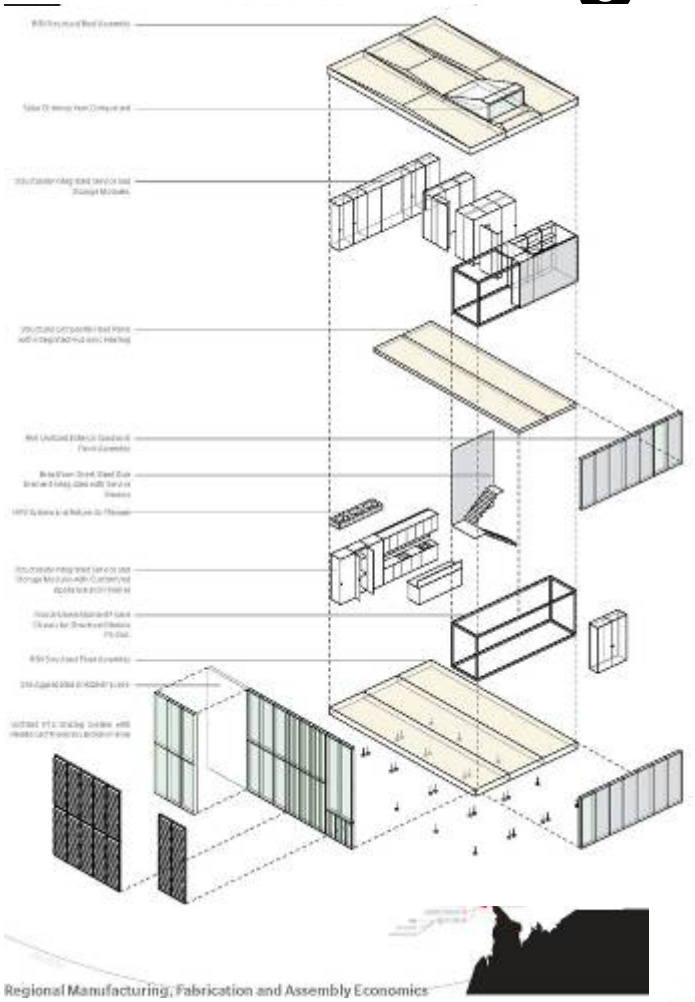
Yes, however it must.

Le Corbusier once said: "The house is a machine for living in." But perhaps the house is no longer a machination for our lives, but an interface between the way we live and our environment: a sustainable blueing, a co-operative, an equality of humankind and the natural environment. And what if this mentality applies on the macro scale as well: perhaps suburbia is an interface between the farmland and dense urbanization. Why can't the sacred mantle of the suburbs transform into healthy urban areas?

This proposal is a critique in search for a sustainable urbanism: a solution for a transformable suburbia.

Living Steel 3rd International Competition: Extreme Housing

Latitude recognizes the radical potential of the single family house to effect massive positive change: it can reduce emissions; it can generate economies; it can propagate sustainable living. The future house can and should be a catalyst for a much healthier planet.



Latitude

Ryerson University & University of Waterloo

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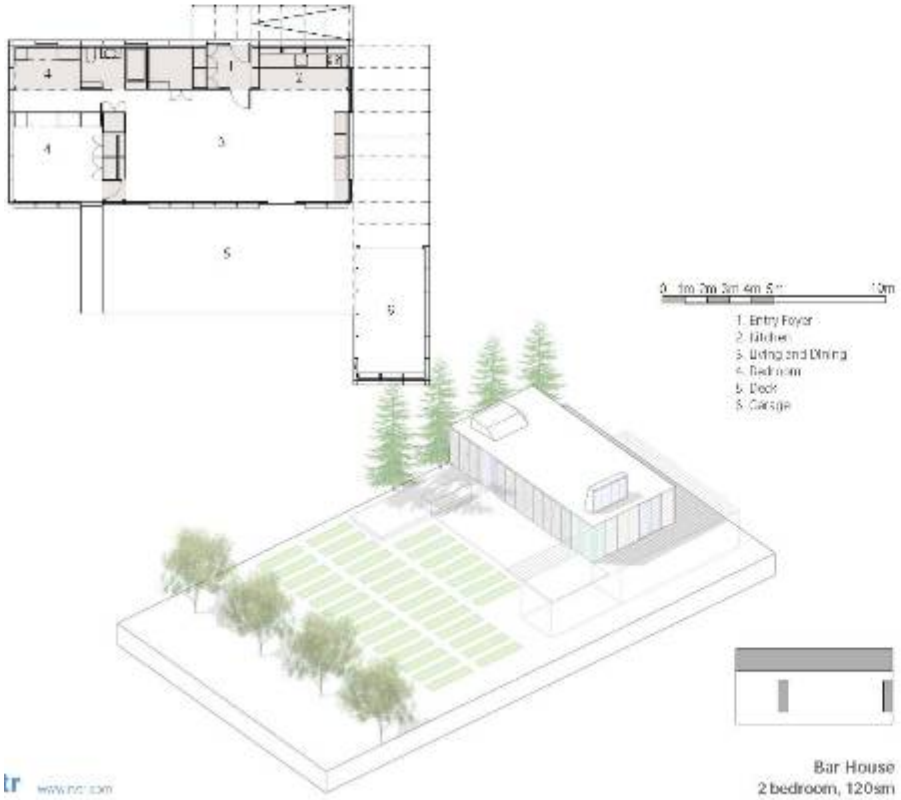

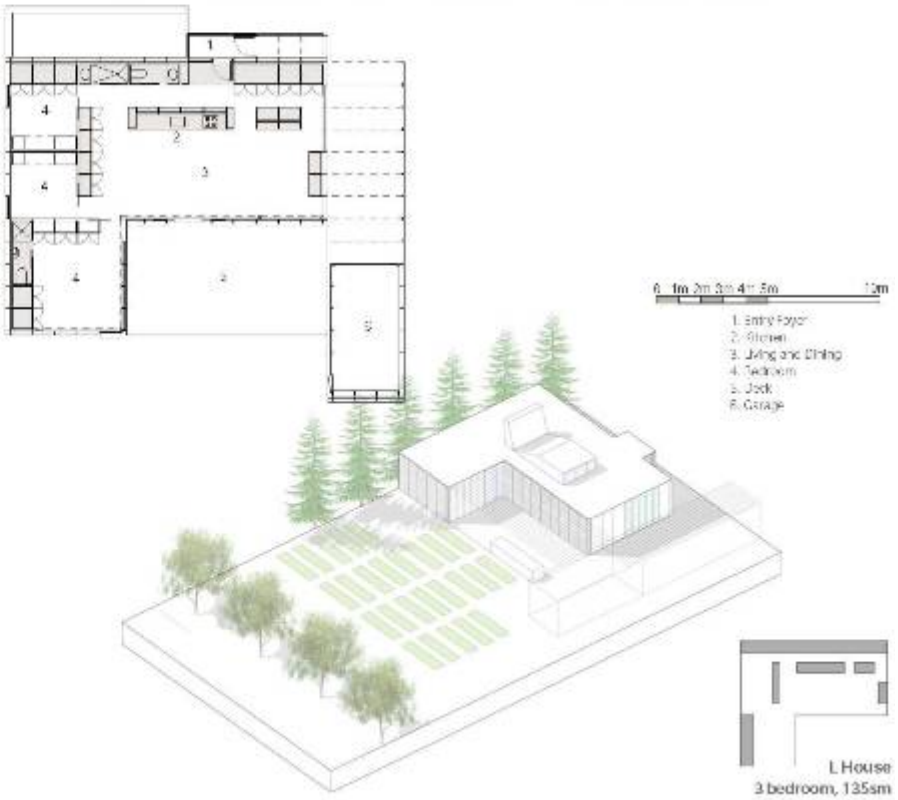

Latitude

Ryerson University & University of Waterloo

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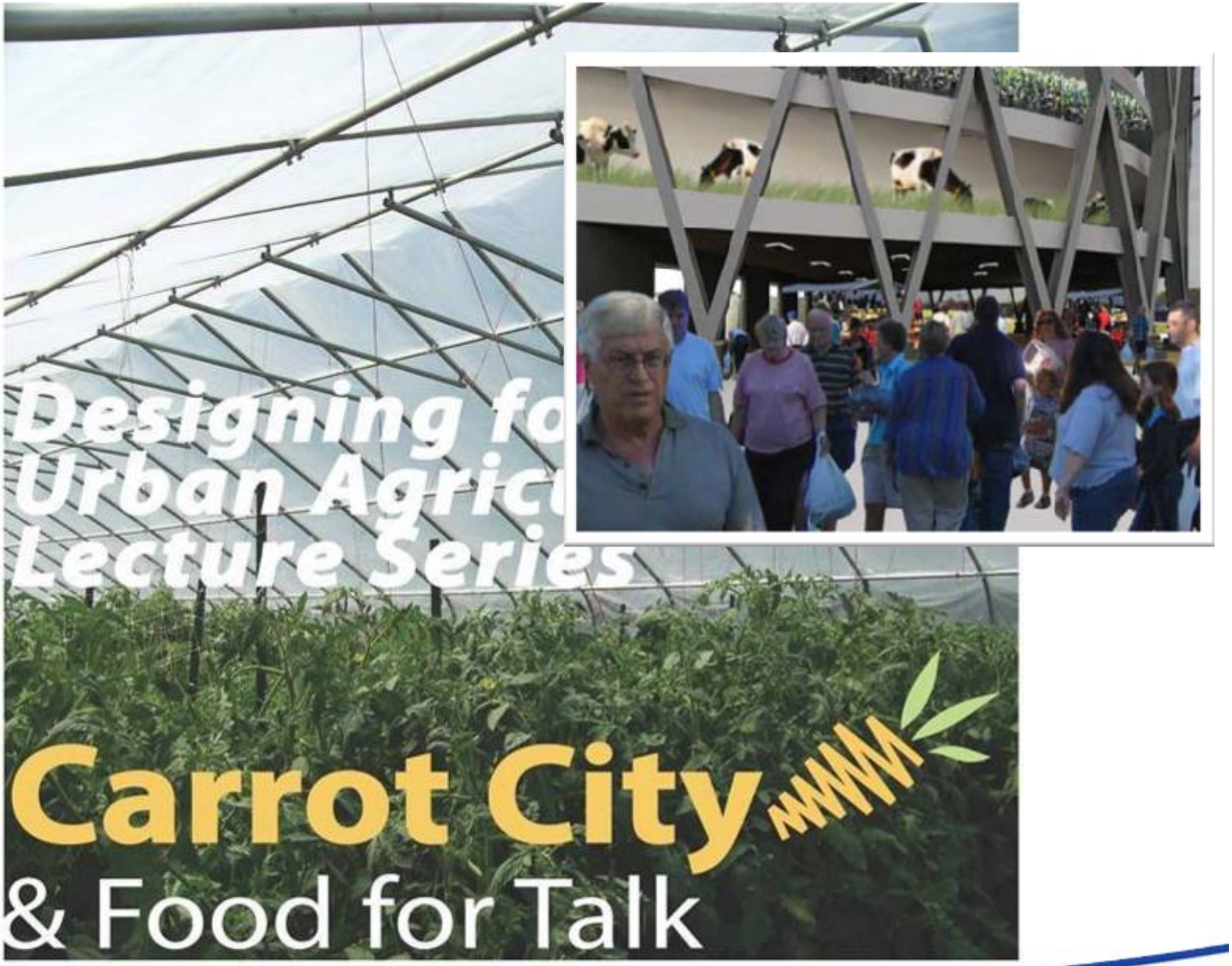

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Sustainable Housing

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The goal is to provide an example of urban housing that achieves the dual and related goals of net zero energy and intensification

Davenport
Net Zero Energy Townhouses

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Ryerson University University of Waterloo University of British Columbia

Solar powered house

- 800 sq. ft
- Highly insulated envelope
- Scalable and adaptable design

Solar Decathlon

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Archetype Sustainable House

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Materials and Technology

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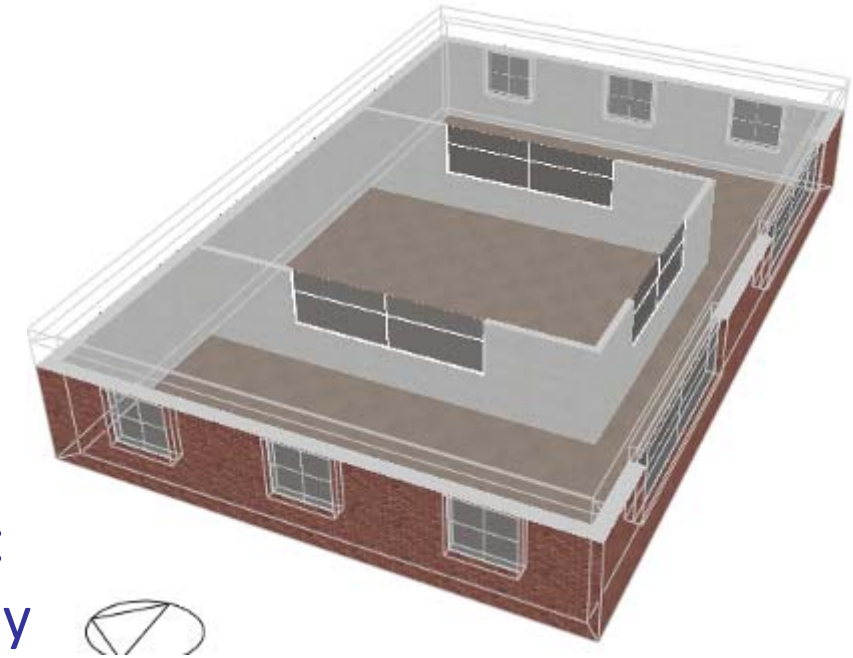
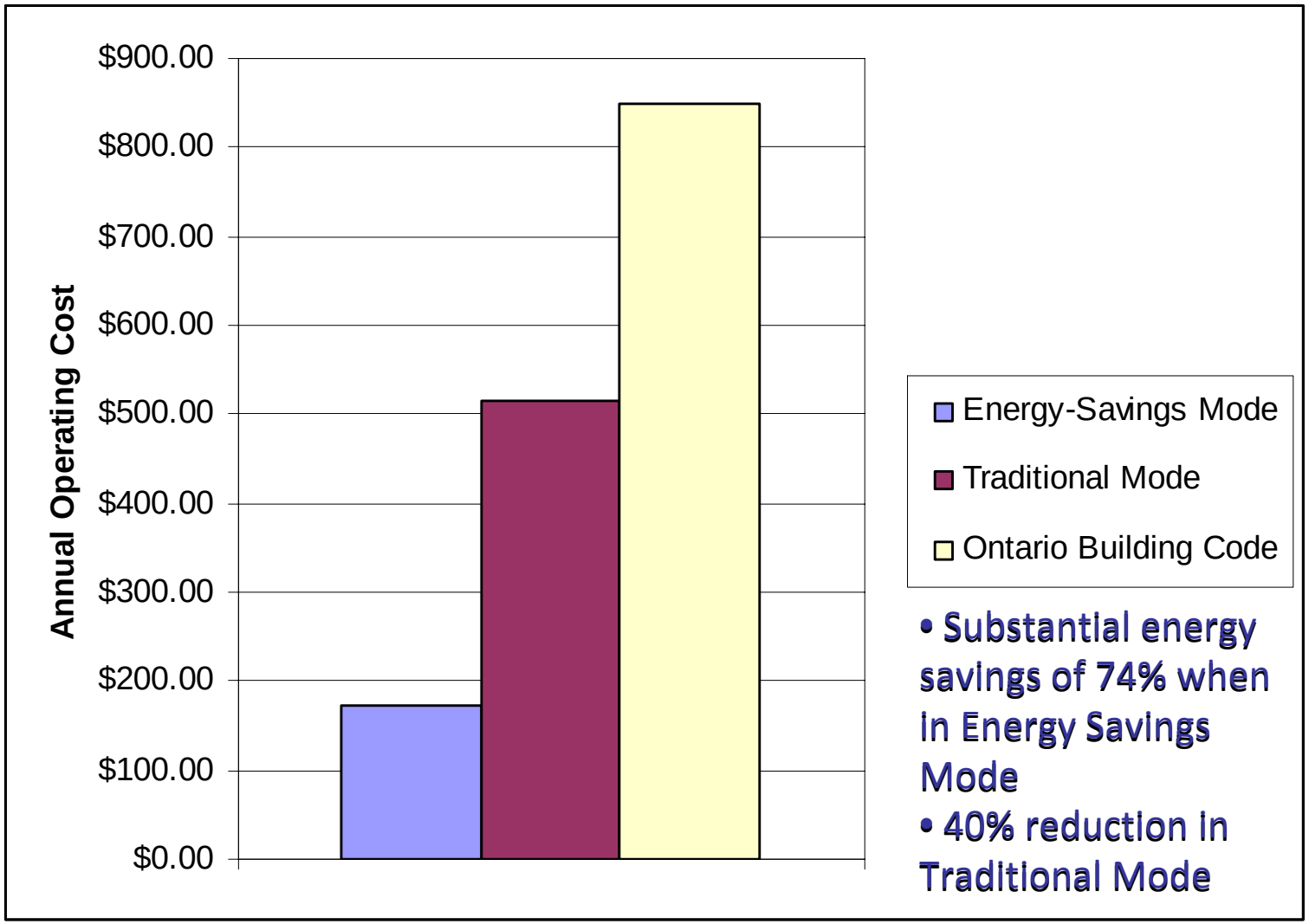


- A house within a house
- 4-season core
- 3-season perimeter buffer
- Perimeter envelope equivalent to an R2000 standard assembly
- Core envelope insulated and air-tight
- Flexibility! Can operate house in traditional or energy savings mode.
- EnergyMode – when conditions demand, core is kept at 21 C and perimeter at 5 C
- Traditional Mode – use entire house (core and perimeter at 21 C)



- Substantial energy savings of 74% when in Energy Savings Mode
- 40% reduction in Traditional Mode

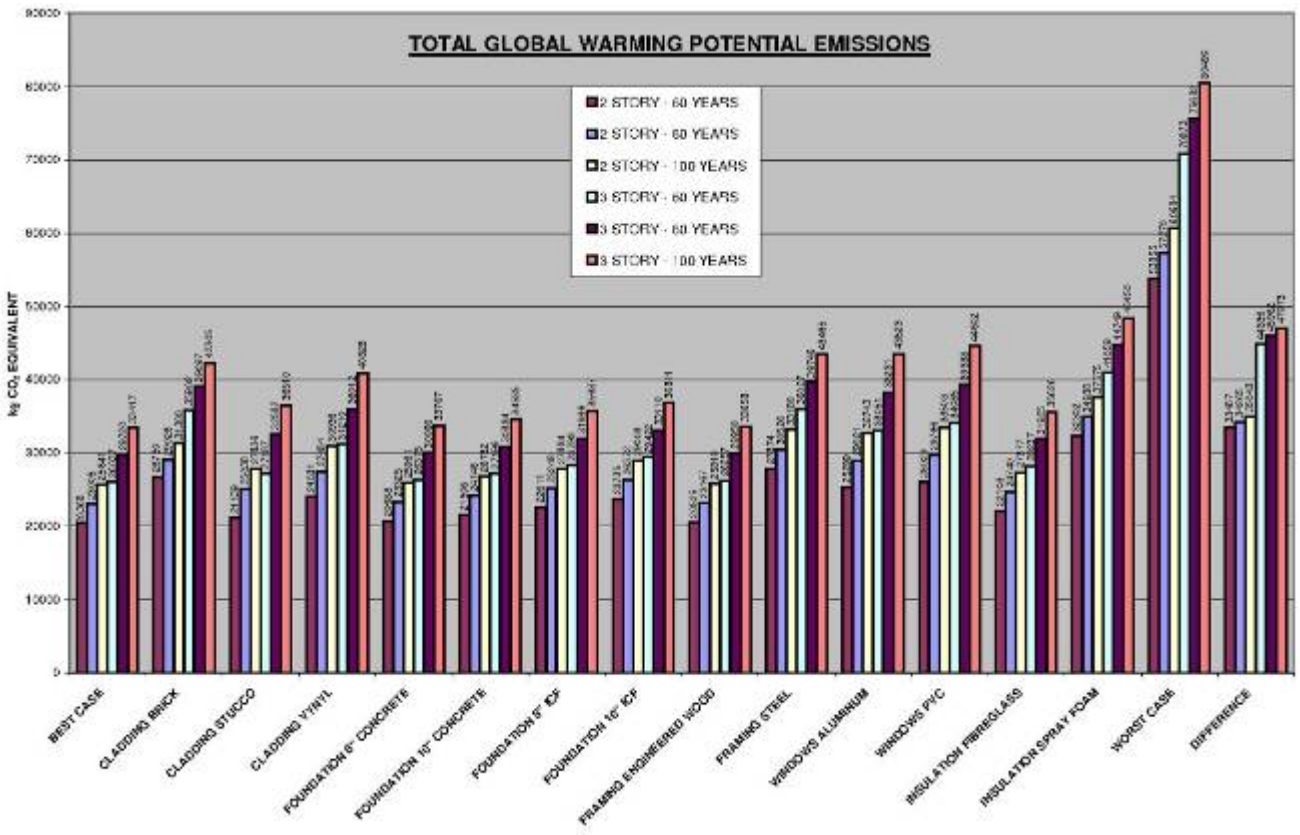
Sustainable Renovation Index

- The residential sector accounts for 21-25% of total energy use
- 13 million dwellings exist in Canada
- Over the next 15 to 25 years, 80-100% of the existing housing stock will be upgraded
- A quantifiable index is required to compare various retrofit strategies
- To be truly “sustainable”, this index must advance beyond the current focus on energy alone

Russel Richman
Department of Architectural Science
RYERSON UNIVERSITY

Quantifying the Environmental Impact of Housing Design Choices in Canada

- Full life cycle energy and green house gas emissions for various permutations of existing and proposed housing designs
- Preliminary results focused on a limited number of systems (i.e. structural and envelope materials) indicates a factor of 2 between the best and worst design choices



Russel Richman
Department of Architectural Science

RYERSON UNIVERSITY

Water penetration through thinner brick veneer wall

Is it possible to reduce the thickness of masonry cladding or redesign masonry units to be lighter and use less material and still maintain acceptable durability and water penetration performance.

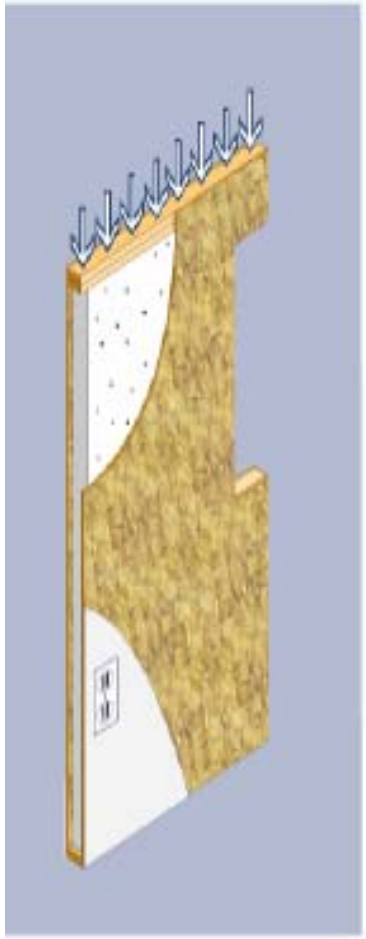
- Water absorbed by masonry walls 90 mm thick brick was only 40% of an 80 mm thick brick wall.
- Samples would indicate that although there is much less water to handle in the cavity, walls get significantly wetter.

Vera Straka
Department of Architectural Science
RYERSON UNIVERSITY

Development of Structural Insulated Sandwich Timber Panels with foam-core spline connections for Residential Construction

Developing experimentally calibrated models capable of predicting accurately their response when subjected to flexural loading.

- Phase 1: flexural testing of SIP's for floor and roofs
- Phase 2: flexural creep testing of SIP's
- Phase 3: flexural testing of SIP headers for windows and doors
- Phase 4: compression and combined compression-flexure testing on SIP walls



Dr. Khaled Sennah
Department of Civil Engineering
RYERSON UNIVERSITY

The effects of local microclimatic conditions of highly urban environments on hygrothermal performance of building envelopes

- NSERC Discovery grant
  - duration: 5 years
  - for support of graduate students
- NSERC Research Tools and Instruments Grant

Test hut (3 x 3 x 3 m), placed on the roof of the Architectural Building Ryerson University, to collect real-time data over 4 seasons which would help improve some existing simulation tools used for overall energy and wood-frame building envelope performance

Dr. Miljana Horvat
Department of Architectural Science

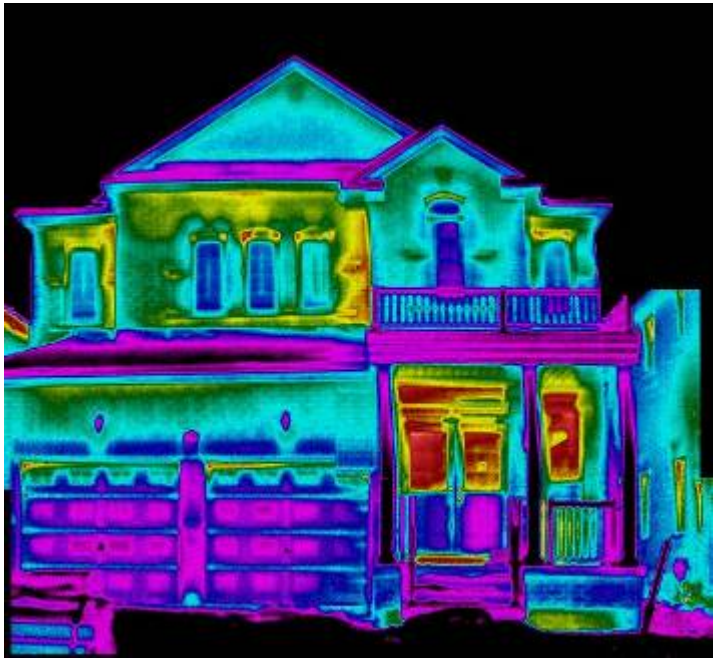
Task 41: Solar Energy and Architecture

- Organizer: International Energy Agency (IEA), Solar Heating & Cooling Programme
- Participating countries: Sweden, Norway, Denmark, Switzerland, Austria, Germany, Portugal, Italy, Spain, Belgium, France, Netherlands, Singapore and Canada
- Duration of the project: 5 years
- ***Vision: To make architectural design a driving force for the use of solar energy***

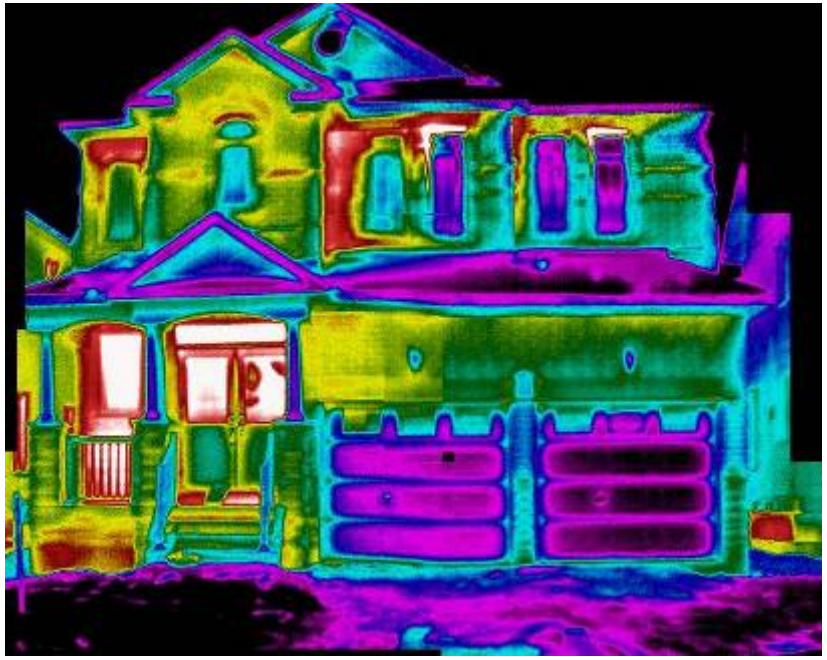
Dr. Miljana Horvat
Department of Architectural Science

Fung, A., A. White, M. Horvat, *The effectiveness of radiant bubble foil insulation – field tests*

Test house with bubble foil insulation



Reference house: greater heat losses



Dr. Miljana Horvat
Department of Architectural Science

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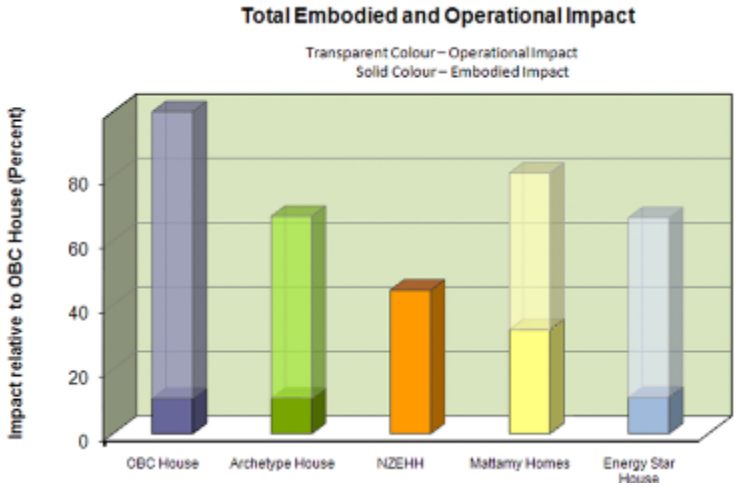

M. Horvat, M. Gorgolewski & A. Cuciureanu: *Operational and embodied impact placed in context*

Dr. Miljana Horvat
Department of Architectural Science
RYERSON UNIVERSITY

Other Related Work

- Water shedding effectiveness of flashing
- Construction Performance Guidelines for houses
- Impact of Climate change on building envelope durability

Hitesh Doshi
Department of Architectural Science, hdoshi@ryerson.ca

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