

Welcome!

Design Principles for Smaller Dwelling Units

June 1, 12:00 PM - 1:00 PM EDT

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Moderator



Steve Schreiber, FAIA

Stephen Schreiber, FAIA, is a Professor and Chair of the Department of Architecture at the University of Massachusetts at Amherst. He is a graduate of Dartmouth College (B.A.) and Harvard University (M.Arch.). Professor Schreiber has served as dean/director at the school of architecture at the University of South Florida, and director of the architecture program at the University of New Mexico. His research and professional work has been published in numerous journals. Schreiber was the 2005-06 President of the Association of Collegiate Schools of Architecture (ACSA). He is a member of the Massachusetts Board of Registration of Architects.



Speaker



Michael Fifield, FAIA

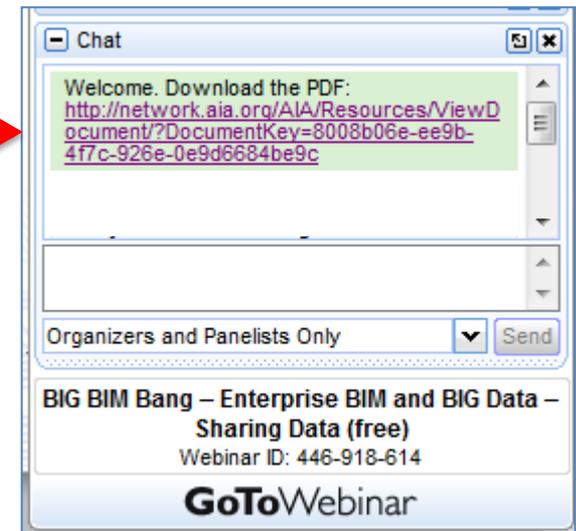
Michael Fifield, FAIA, AICP is Professor of Architecture at the University of Oregon in Eugene where he is Director of the Housing Specialization Program and is principal in the firm Fifield Architecture + Urban Design. His teaching and practice concentrates on smart growth and smaller dwelling unit design as a key to sustainability. Michael has received numerous architecture and planning awards for his work. He is a graduate in architecture from UC Berkeley and UCLA.



Questions?

Submit a question to the moderator via the chat box.

Content related questions will be answered during the Q&A portion as time allows.



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Course Description

Smart growth and smaller dwelling units may address issues of sustainability far better than relying on technology. This webinar will present design strategies for developing smaller dwelling units as a means to achieve affordability in both initial and life-cycle costs while providing meaningful and appropriate designs for the ever increasing number of smaller households in the U.S. Examples will be included.



Learning Objectives

Participants will...

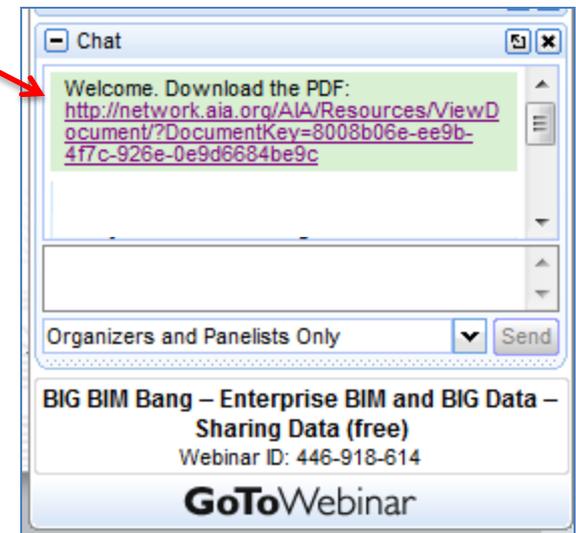
1. ...learn how smart growth practices and smaller residential units are important considerations in achieving true sustainability.
2. ...be able to identify the core principles in achieving sustainable communities through smart growth and small unit design practices.
3. ...gain an understanding of various small unit design principles with a variety of built examples.
4. ...gain an understanding of ways smaller units on smaller lots can achieve both short-term and long-term sustainability and affordability.



Questions?

Submit a question to the speaker via the chat box.

They will be answered as time allows.



SMART GROWTH AND SMALLER RESIDENTIAL UNIT
DESIGN PRINCIPLES AS A KEY TO SUSTAINABILITY

MICHAEL FIFIELD, FAIA





Sprawl, Large Lots, and Large Houses

In a world of diminishing natural resources, increased population, and limited lands for agriculture, forest, wetlands, and recreation, our current pattern of large houses on large lots is unsustainable.





Shelter ?

The question of what is meaningful and appropriate shelter is long standing.

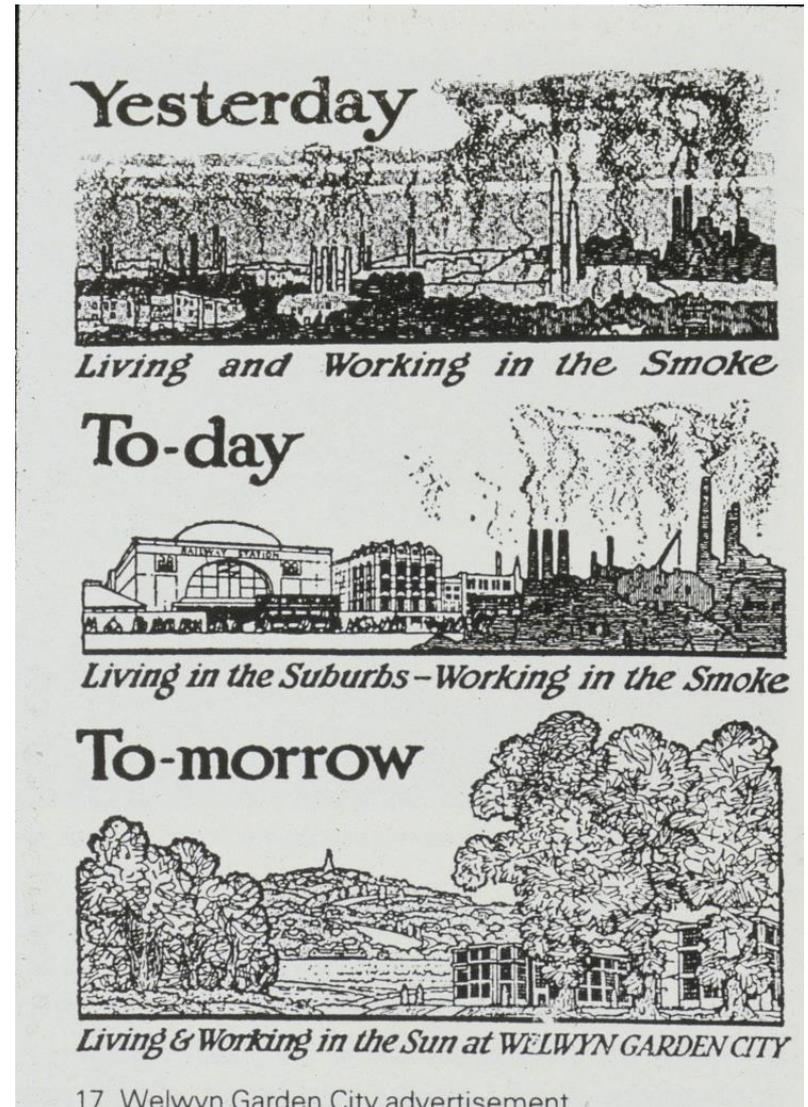
However, in a world of diminishing natural resources, increasing world population, climate change, affordability issues, and loss of land for agriculture, forest, wetlands, and recreation, meaningful residential design is most critical in today's world.





Past Examples to Address the Problem

English Garden Suburbs





Shelter in the U.S.

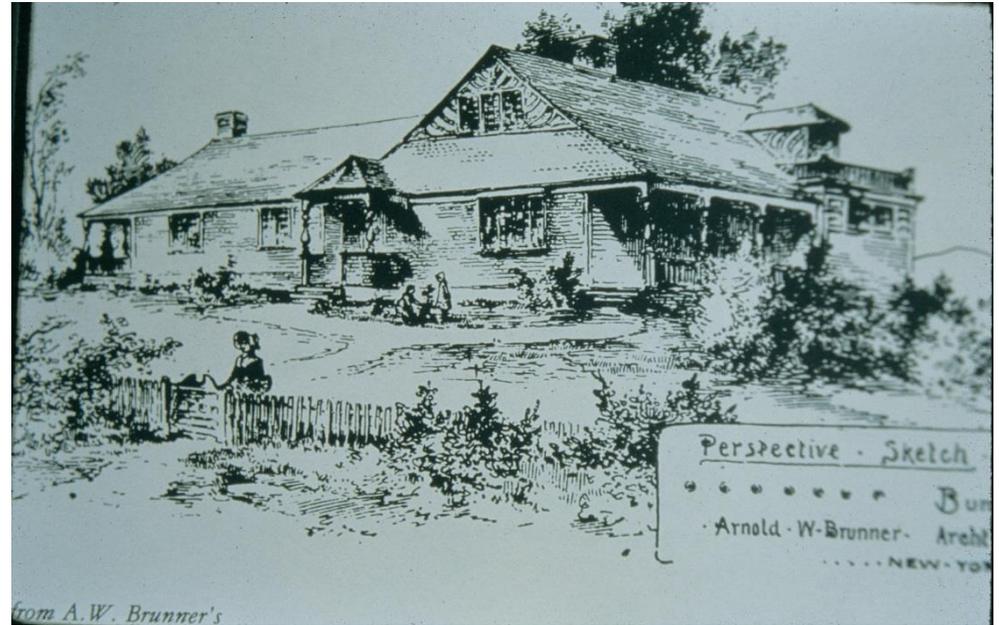
In the United States there was a
severe lack of adequate housing.





Response to issue
of lack of
adequate housing
in the U.S.

The *Ideal Home* and
its characteristics.





Promoting the Ideal Home

Pattern Books





Example from
Pattern Book

Bungalow House in
Pasadena





Introduction of the Automobile

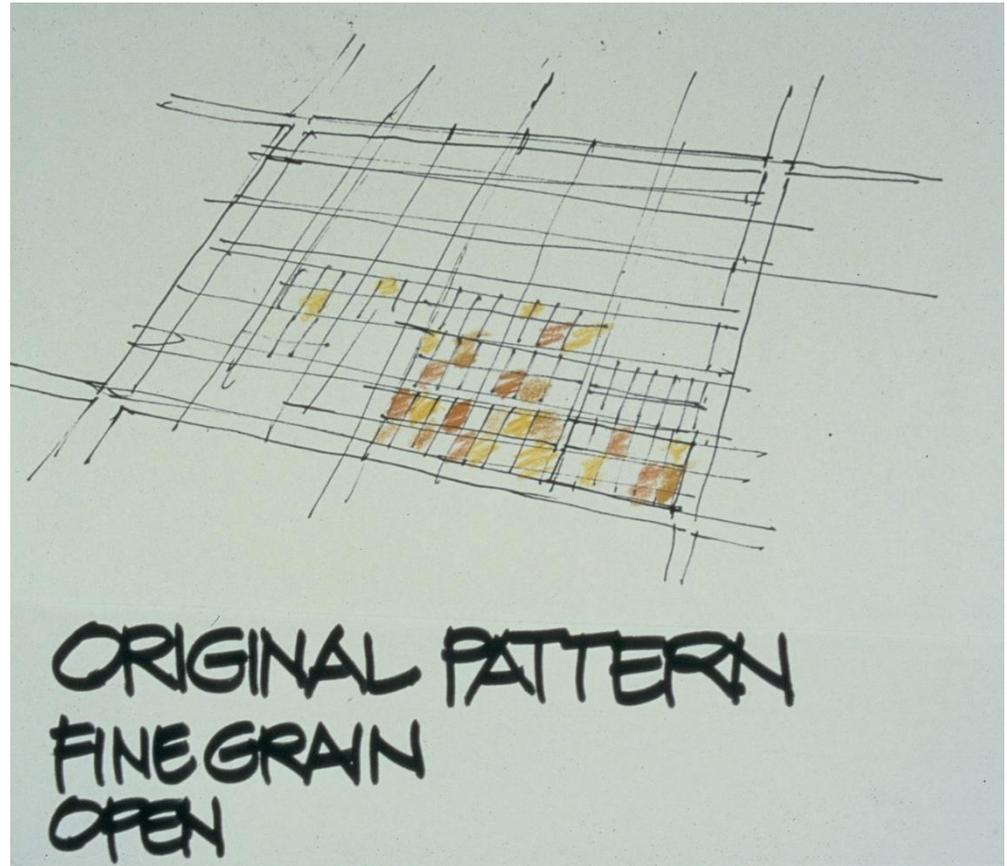
Technology begins to
change residential
patterns





Original Pattern of Residential Development

Small Lots and
Small Houses





Typical House in Early to Mid 20th Century

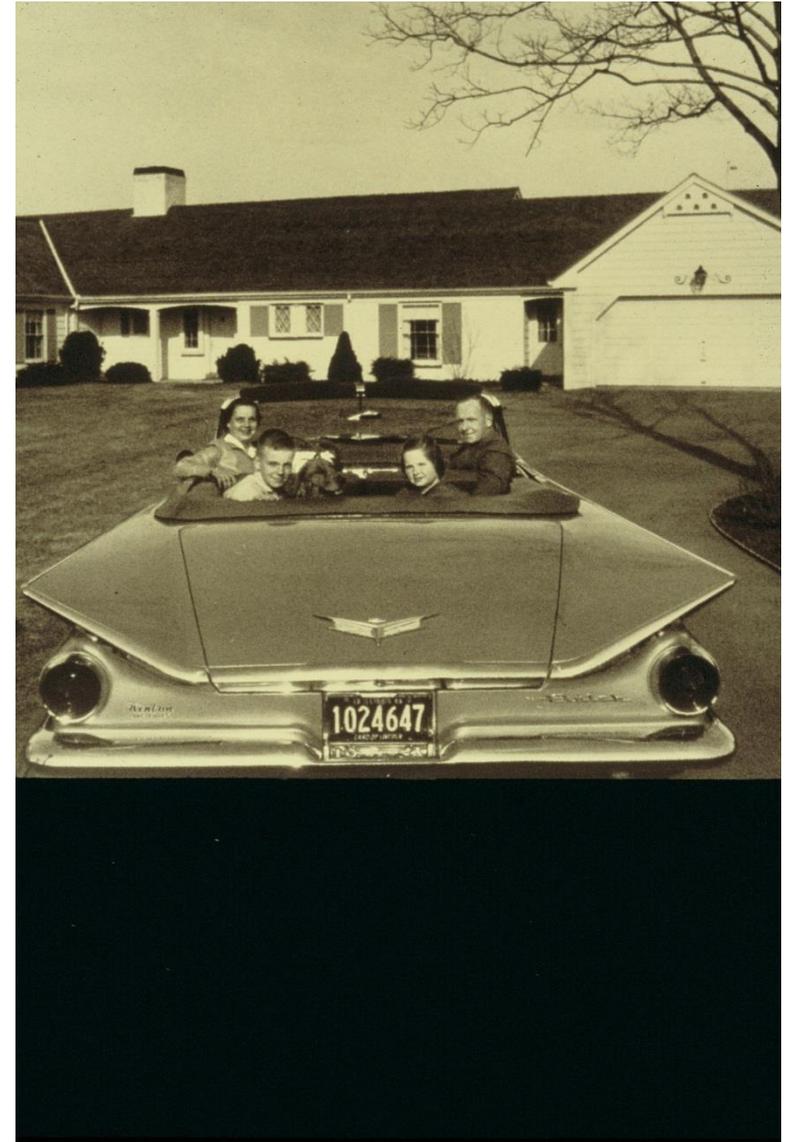
Similar Characteristics
from previous Pattern
Book examples





Greater Use of Automobiles

Results in a change in house form with the garage taking up a significant percentage of the frontage of houses.





Changes in House and Household Size

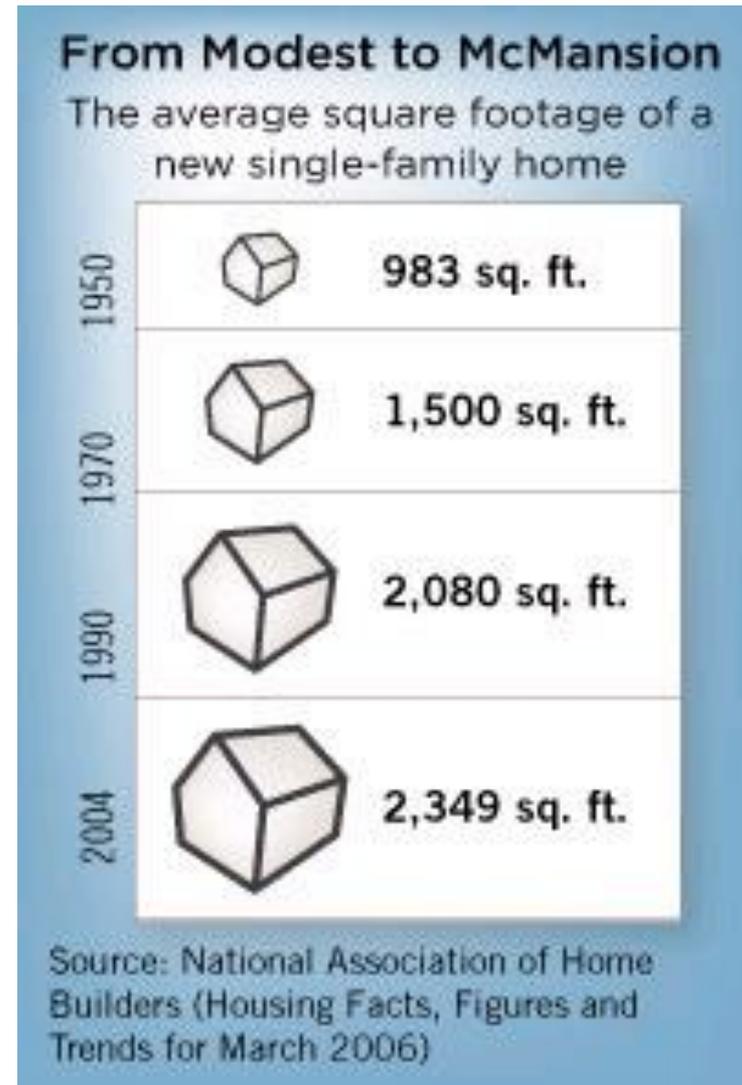
House size has increased dramatically while household size has decreased.





House Size Comparisons by Year

While household size has decreased, in a little more than fifty years, house size has increased by almost 240%.





The Dilemma of the Non-Traditional Household

Trends in household composition and size that are contributing to the need for a greater diversity of housing types (taken from U.S. Census Bureau statistics from 1970 - 2003)

Household Size

- a decrease in the number of households with 5 people or more from 20.9% to 9.8%
- a decrease in the number of households with 4 people from 15.8% to 14.3%
- a decrease in the number of households with 3 people from 17.3% to 16.1%
- an increase in the number of households with 2 people from 28.9% to 33.3%
- an increase in the number of households with 1 person from 17.1% to 26.4%

Household Type

Family Households:

- married couples with children have decreased from 40.3% to 23.3%
- married couples without children have decreased from 30.3% to 28.2%
- other family household types have increased from 10.6% to 16.4%

Nonfamily Households:

- men living alone have increased from 5.6% to 11.2%
- women living alone have increased from 11.5% to 15.2%
- other nonfamily households have increased from 1.7% to 5.6%



The Traditional Nuclear Family...

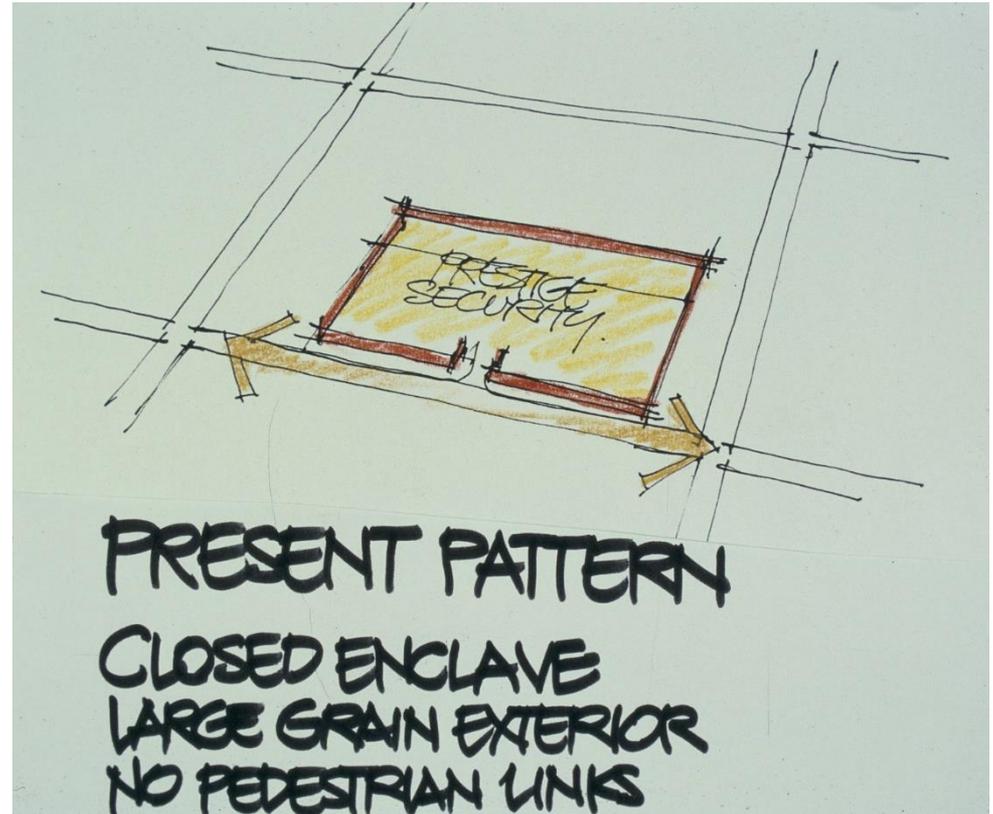
... is no longer the norm. Married couples with children have decreased from 40.3% to 23.3% of all households during the period 1970-2003.





Present Pattern

Large houses on large lots, many in closed enclaves, results on the use of the automobile more than ever.





Garage Domination

Garages have come to occupy more than 50% of the frontage of many houses, resulting in little engagement of the occupants of a house with the public realm.





Garage as 100% of Frontage

With no relationship
to the public realm,
any private outdoor
space used for
recreation is in the
rear yard.





The suburbs are
now seen
through the *lens*
of the
automobile

Suburban
development, with
large houses on large
lots, and wide streets,
limits opportunities
for pedestrians.





Technology vs. a romantic longing for the past....

An on-going dilemma as characterized by Craig Hodgetts in this rendering.





Is Technology
the Answer?

Yes and No.



Disneyland Monsanto House of the Future



Reasons for **Smaller** Lots

- Less sprawl
- Less sprawl results in saving of open space (e.g., agriculture, recreation, forest)
- Saving open space has long-term environmental & economic benefits
- Less Infrastructure
- Better chance for public transportation with higher densities
- Fewer miles traveled by automobile
- Higher densities allow for more walkable communities
- Higher densities require fewer schools, fire stations, and police substations
- Less costs
- Less maintenance



Reasons for **Smaller** Units

- Smaller dwelling units require less land area
- Household sizes have decreased
- Fewer natural resources needed for building materials
- Less embodied energy used to produce building materials
- Less transportation costs to deliver (fewer) building materials
- Less expensive/ more affordable
- Less life-cycle costs
 - Less energy used to heat and cool a smaller dwelling unit
 - Less maintenance



What People Want in Housing

- Privacy (visual and auditory)
- Useable outdoor area(s)
- Safety and security
- Parking
- Storage
- Adequate space for food prep, eating entertainment, relaxation, sleeping, guest bathing, work, hobby
- Flexibility for change over time
- Identity
- Affordable in initial costs and life-cycle costs
- Relationship to services (schools, grocery, restaurants, shopping, recreation), work
- Sense of individual identity
- Sense of community (?)



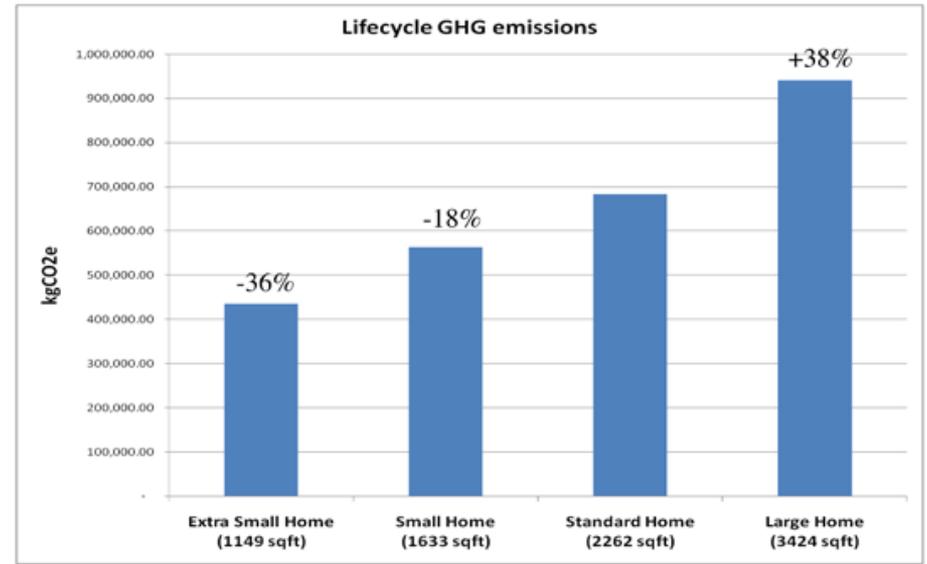
Size Matters

Smaller homes (<1,200 s.f.) can reduce life-cycle greenhouse emissions by about a third compared to a standard home of almost 2,300 s.f.

Size Matters



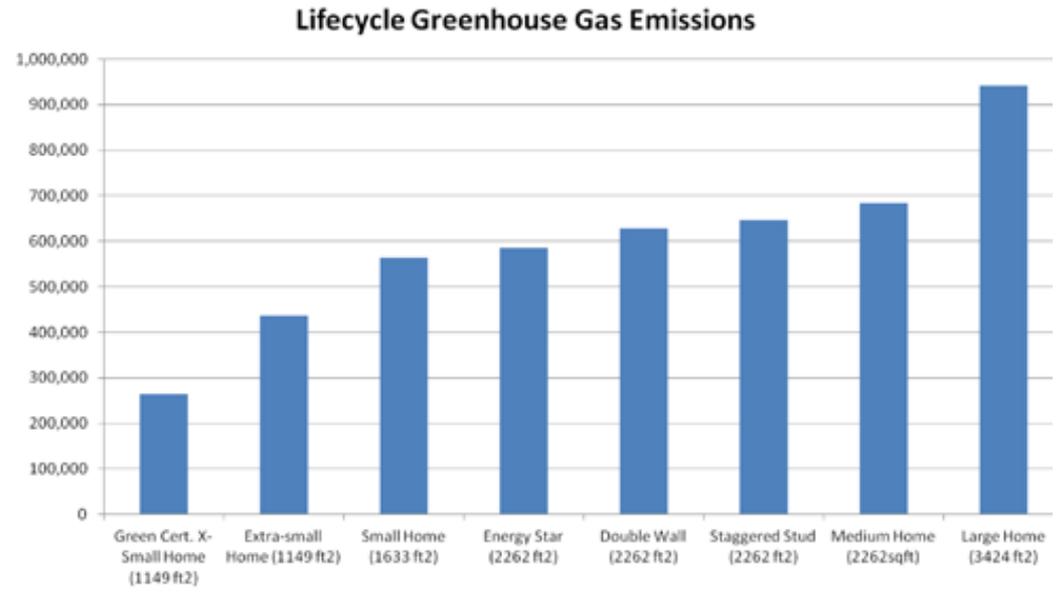
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Size + Technology

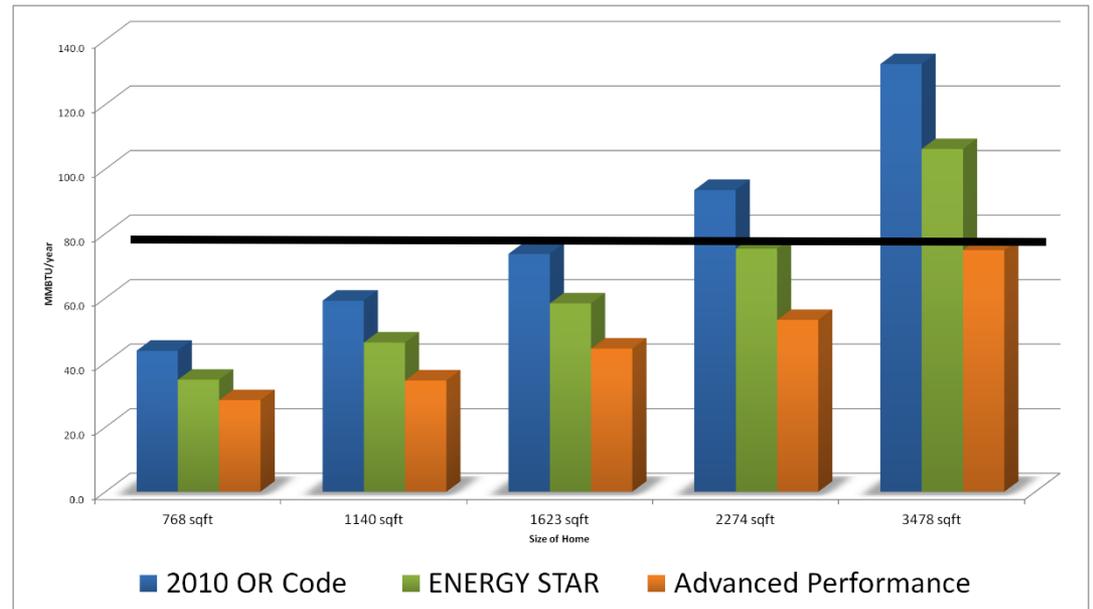
When smaller size is also used with energy saving construction techniques, lifecycle greenhouse gas emissions can be drastically reduced.





Measure of Energy Use

Smaller homes with energy saving construction techniques can drastically reduce energy use.





Design Principles to Consider for Smaller Dwelling Units

Multiple Uses instead of Separate Rooms
Promote Indoor / Outdoor Relationships
Engagement with the Outdoors
Outdoor Rooms
Borrowed Landscapes
Use of Articulated Surfaces
Dissolved Corners and Continuation of Views
Open Plan / Section
Creative Use of Storage
Challenge the Conventional



Multiple Use of Rooms

Study / Sleeping or
Study / Occasional
Guest Sleeping





Multiple Use of Rooms

Study / Library /
Guest Sleeping





Multiple Use of Stair Landing

Reading, storage,
guest sleeping





Multiple Use of Hallway

Hallway as room used
as library, reading,
guest sleeping.

Lots of windows
changes the
perception of a
hallway into a room.



Thomas Hacker, FAIA, Architect



Multiple Uses in One Area

Built-in cabinetry can accommodate many different uses such as a work surface, a “Murphy Bed” for sleeping, or hiding both to allow for a lounge area.



Will Zenk,
Design



Rooms with Alcoves

Different functions can be located in alcoves, thus reducing redundant circulation.



James Givens Design



Use of Alcoves

Different functions can be located in alcoves, thus reducing redundant circulation.



James Givens Design



Use of Vertical Space to Save Floor Area

Consider bunk bed
design that is
desirable for upper
bunk occupant



James Givens Design



Promote Indoor / Outdoor Relationships

Thoughtful placement of *glass wall* extends visual engagement to the outdoors.
Outdoor space can be small and very useable at the same time.



Ray Kappe, FAIA, Architect



Promote Indoor / Outdoor Relationships

*Window / Glass Door
Wall* breaks down the
separateness of
indoors and outdoors.

Covered deck acts as
an outdoor room and
as transition to
garden.



Michael Fifield, FAIA, Architect



Promote Indoor / Outdoor Relationships

Wall as door slides open to reveal outdoor room and view beyond.



Miller Hull Partnership



Promote Indoor / Outdoor Relationships

Thoughtful placement
of *glass wall* extends
physical and visual
engagement to the
outdoors.

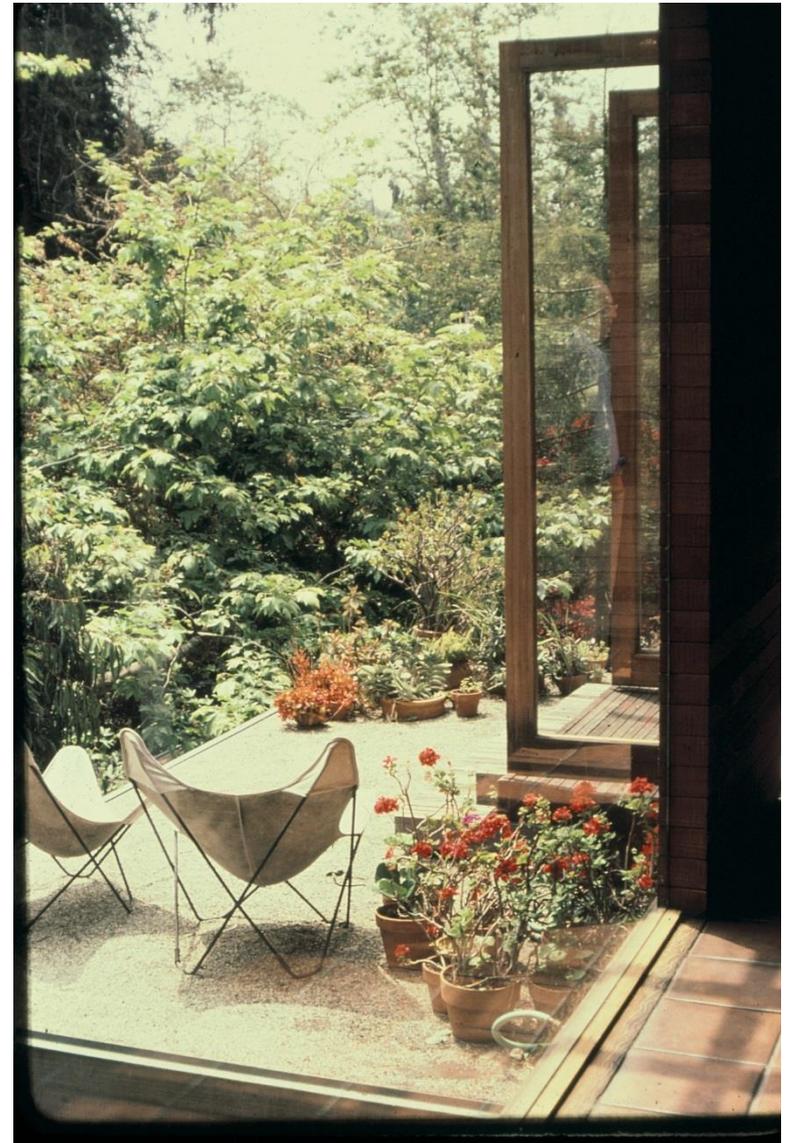


Lanefab Design/Build, Vancouver, B.C.



Indoor / Outdoor Engagement

Indoor rooms opening
to outdoor rooms



Ray Kappe, FAIA, Architect



Outdoor Rooms

The front door of this example by Ross Chapin, FAIA, is through an outdoor room. Positioning it near the middle of the house eliminates the need for interior hallways. Outside circulation is inexpensive compared to inside hallways.



Ross Chapin, FAIA, Architect



Outdoor Rooms

Opening onto defined outdoor patio space may provide desirable space in a small area.



Schindler Pueblo Ribera Court Remodel



Outdoor Rooms

Opening onto defined outdoor patio space may provide desirable space in a small area. This example shows how a “front yard” may be reconsidered on a small lot.



Lanefab Design/Build, Vancouver, B.C.



Outdoor Rooms

Rethinking the “front yard.”

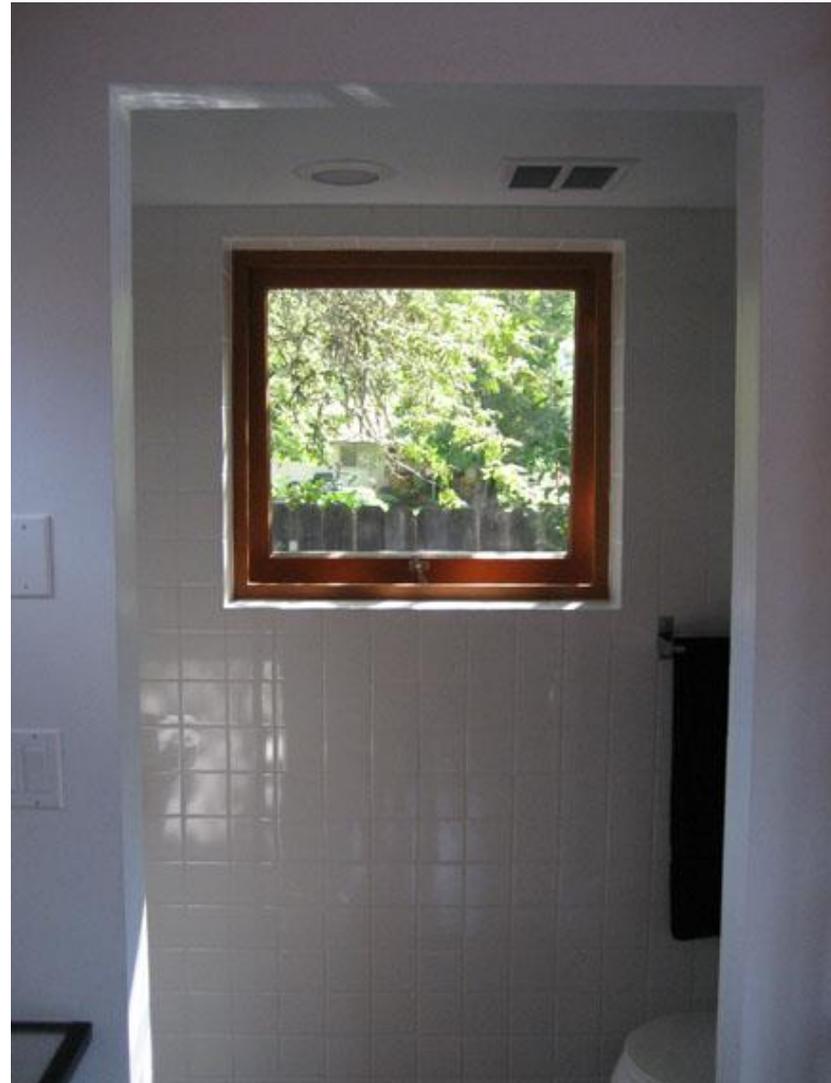


Katherine Spitz, AIA, ASLA, Landscape Architect



Borrowed Landscapes

Extend views from
inside to outside to
take advantage of
outdoor amenities.



Michael Fifield, FAIA, Architect



Borrowed Landscapes

Increase the visual
perception of indoor
rooms size with
connections to the
outdoors and
borrowed landscapes.



Ray Kappe, FAIA, Architect



Use of Articulated Surfaces

Built-in shelves,
drawers, and closets
can provide storage,
visual diversity, and
extension of room
size.



Otto Poticha, FAIA, Architect



Use of Articulated Surfaces

Open joists in ceiling
visually extends the
height of rooms.
Open shelving
extends the depth of
rooms also.

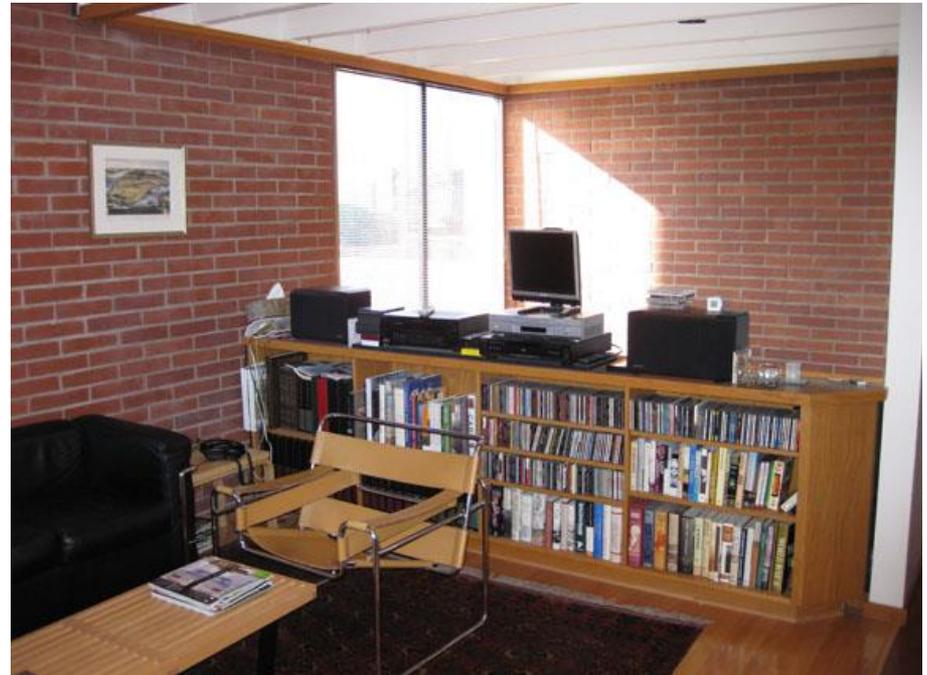


Otto Poticha, FAIA, Architect



Use of Articulated Surfaces

Open joists ceiling,
built-in shelving,
different wall
surfaces, and
openness to below
and outside, all help
to make a small space
seem much larger.

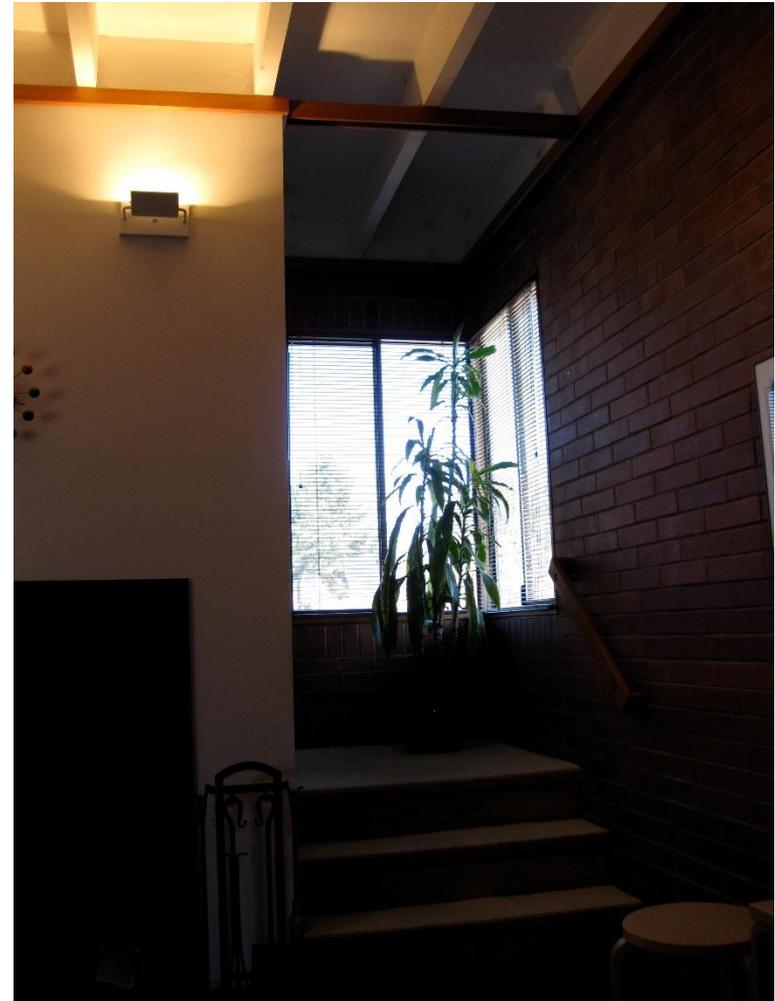


Otto Poticha, FAIA, Architect



Dissolved Corners and Continuation of Views

Rooms that extend
visually beyond walls
and have views to the
outside seem bigger.

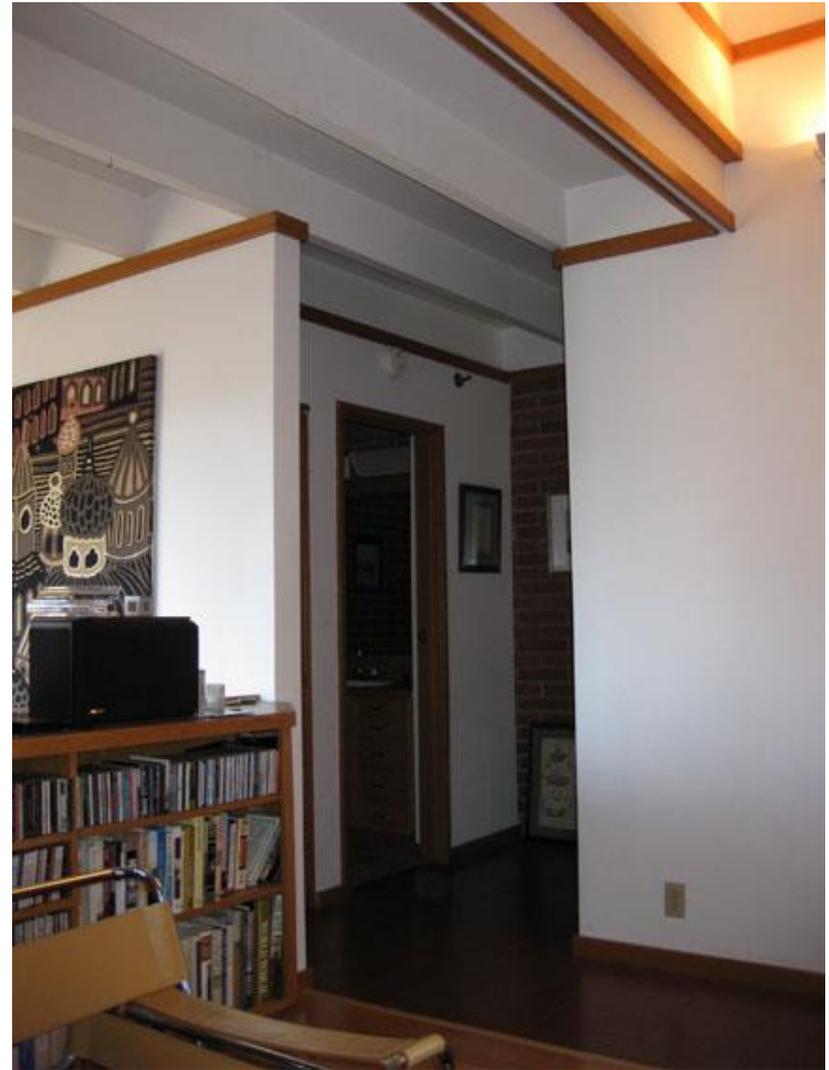


Otto Poticha, FAIA, Architect



Dissolved Corners and Continuation of Views

Rooms appear bigger
with dissolved
corners, articulated
surfaces, varying
ceiling heights and
openness to below.



Otto Poticha, FAIA, Architect



Dissolved Corners and Continuation of Views

Rooms appear bigger with dissolved corners and walls, articulated surfaces, varying ceiling heights, views to the outside, and reflective surfaces such the polycarbonate closet door.

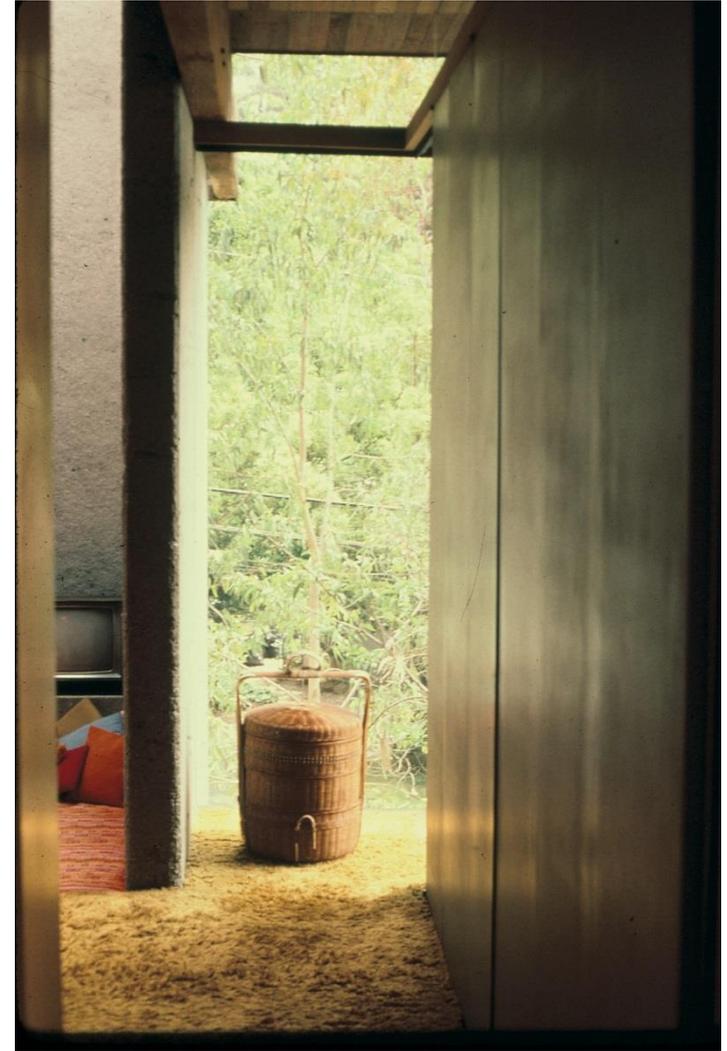


Michael Fifield, FAIA, Architect



Continuation of Views to the Outdoors

When entering a room, consider a view directly to the outside to extend the perception of the size of the room.

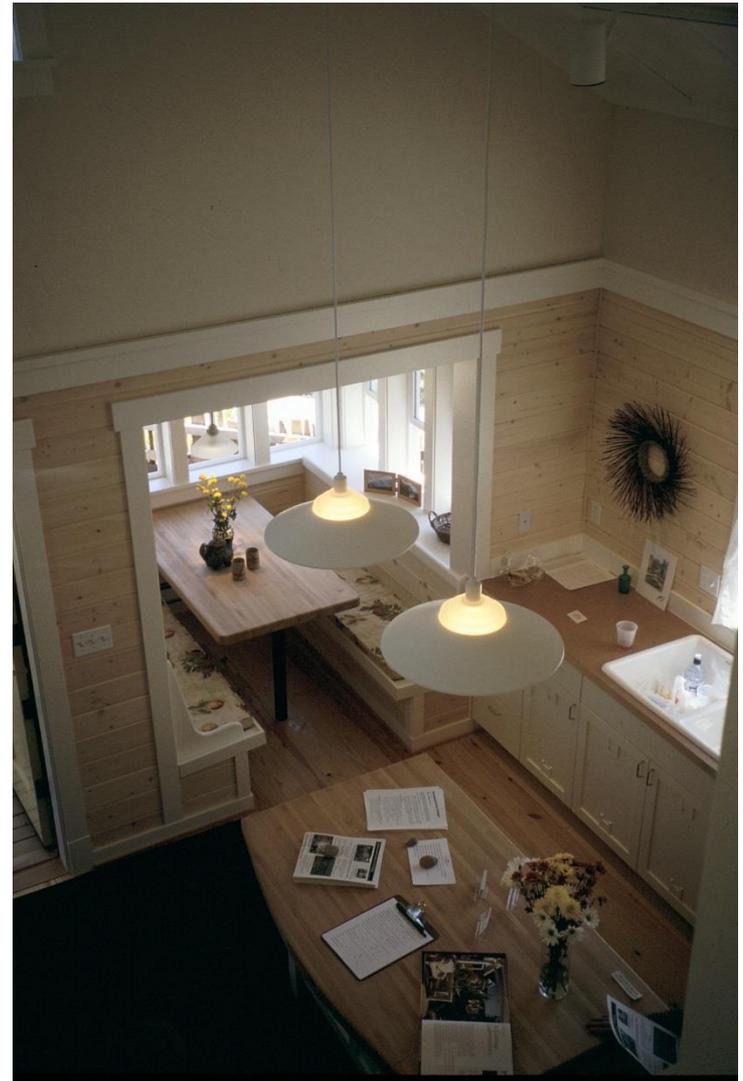


Ray Kappe, FAIA, Architect



Open Plan and Section

The use of multiple functions in one room and seen in both plan and volume can provide an added perception of size.



Ross Chapin, FAIA, Architect



Open Plan and Section

This example demonstrates multiple uses in one room, relationship to outdoors, articulated surfaces, and open to above – all contributing to a greater perception of size.

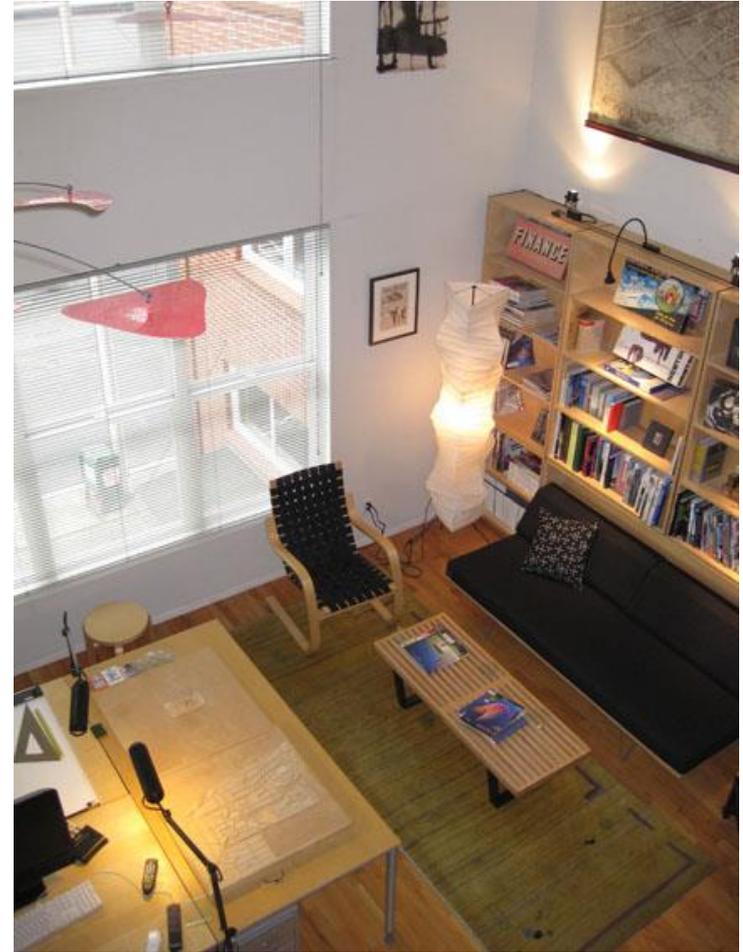


Otto Poticha, FAIA, Architect



Open Plan and Section

This example demonstrates multiple functions in one room with high ceilings, articulated surfaces, and many windows providing light and views – all making a small space seem much larger.

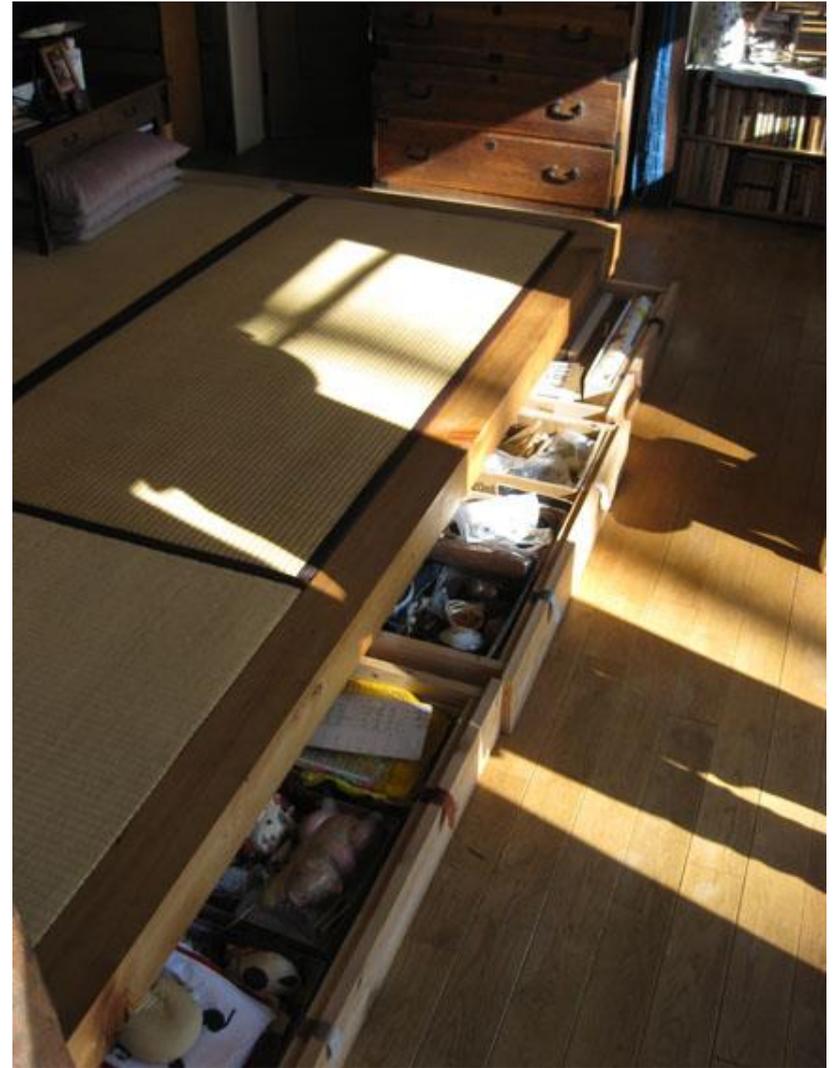


Michael Fifield photo



Creative Use of Storage

Utilizing area beneath a sleeping platform for storage as shown in this case in Japan.



Michael Fifield photo



Creative Use of Storage

Utilizing the area beneath a stair for storage.





Creative Use of Storage

A vertical differentiation of floor levels can provide opportunities for additional storage including closets and deep drawers.



Otto Poticha, FAIA, Architect



Challenge the Conventional

A minimal dwelling
with multiple uses by
Donald McDonald,
FAIA.

Living, food
preparation, and
sleeping, all is one
space.





Creative Use of Storage

A raised indoor living room / garden allows for additional storage under the floor in this example in Tokyo.



Akira and Maya Mada, Architects. Michael Fifield photo



Challenge the Conventional

Guest sleeping loft for
children as in this
example of Joseph
Esherick's Hedgerow
House #1 at Sea
Ranch.



Joseph Esherick, FAIA, Architect. Photo by Michael Fifield



Challenge the Conventional

Consider smaller
circulation space as
seen in these
examples – one a
kitchen in Chios,
Greece, and the other
a bathroom in Kyoto,
Japan.



Photos by Michael Fifield



“True sustainability is not about
gadgets or technology, it is about
context”

David Owen from Green Metropolis:
Why Living Smaller, Living Closer, and Driving
Less are the Keys to Sustainability



Thank You