

# Welcome!

## Design Principles for Smaller Dwelling Units

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

Earn 1.0 AIA HSW LUs



## 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**

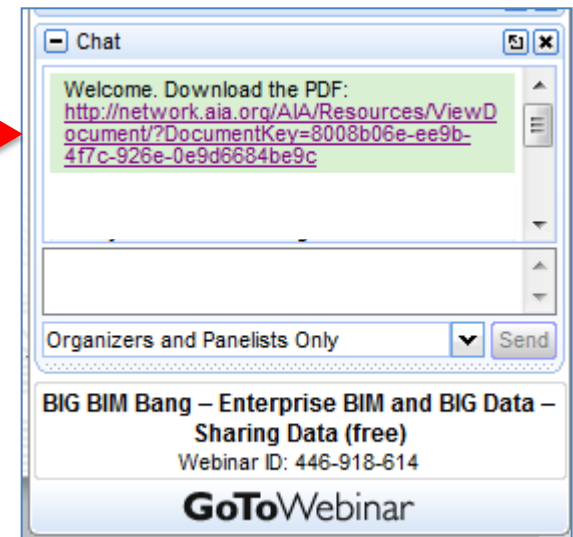
Michael Fifield, FAIA, AICP is Professor of Architecture at the University of Oregon in Eugene where he is Director of the Housing Specialization Program and is principal in the firm Fifield Architecture + Urban Design. His teaching and practice concentrates on smart growth and smaller dwelling unit 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.

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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...

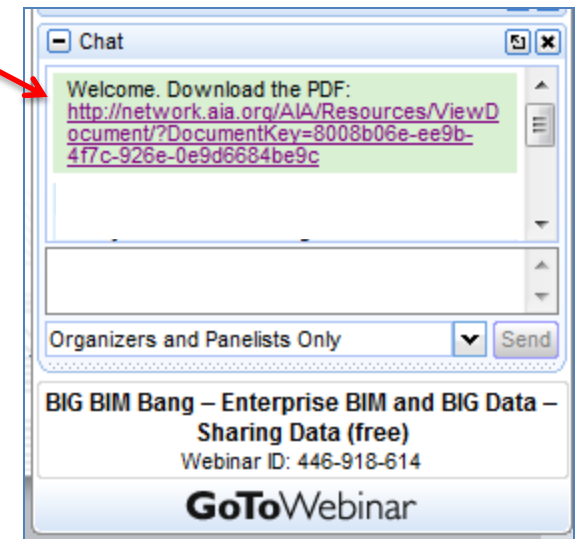
1. ...learn how smart growth practices and smaller residential units are important considerations in achieving true sustainability.
2. ...be able to identify the core principles in achieving sustainable communities through smart growth and small unit design practices.
3. ...gain an understanding of various 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

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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.

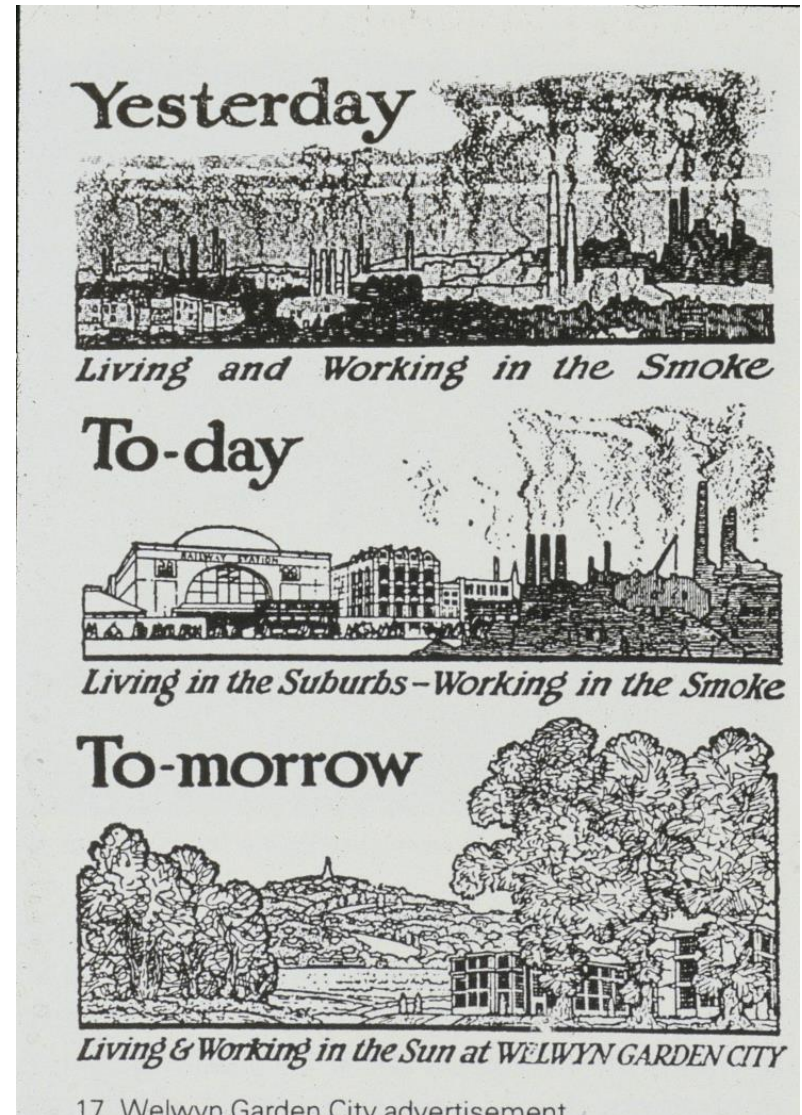
However, in a world of diminishing natural resources, increasing world population, climate change, affordability issues, and loss of land for agriculture, forest, wetlands, and recreation, meaningful residential design is most critical in today's world.





# 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.

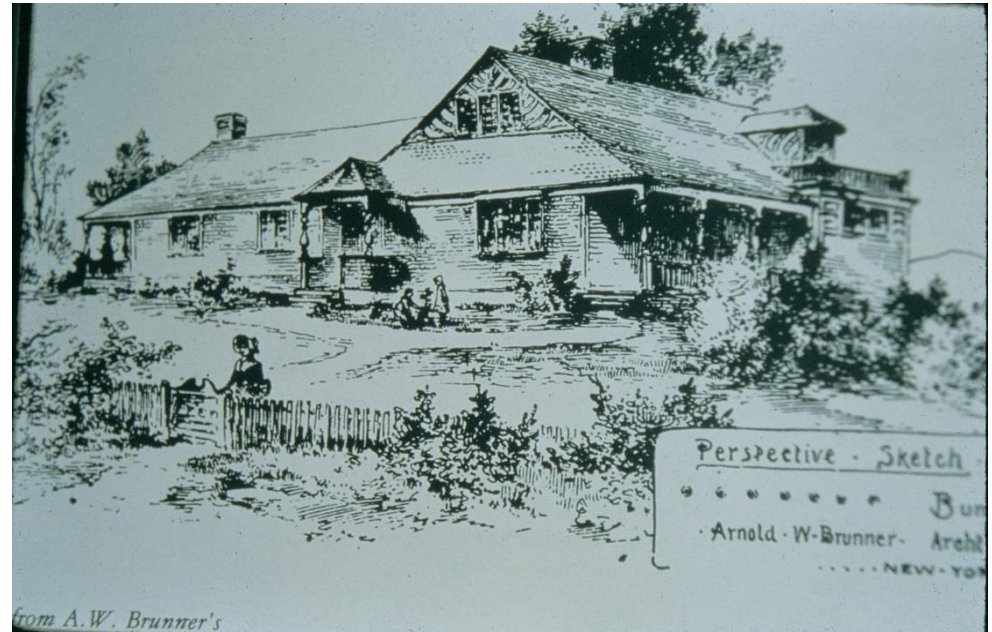






Response to issue  
of lack of  
adequate housing  
in the U.S.

The *Ideal Home* and  
its characteristics.





# Promoting the Ideal Home

## Pattern Books





## Example from Pattern Book

Bungalow House in  
Pasadena

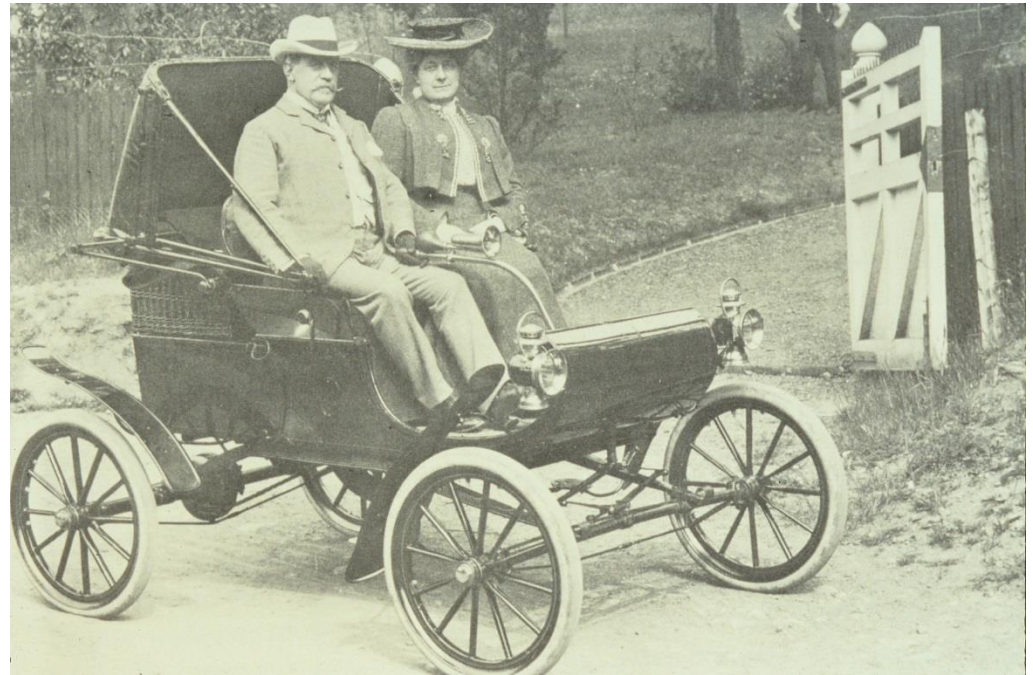






## Introduction of the Automobile

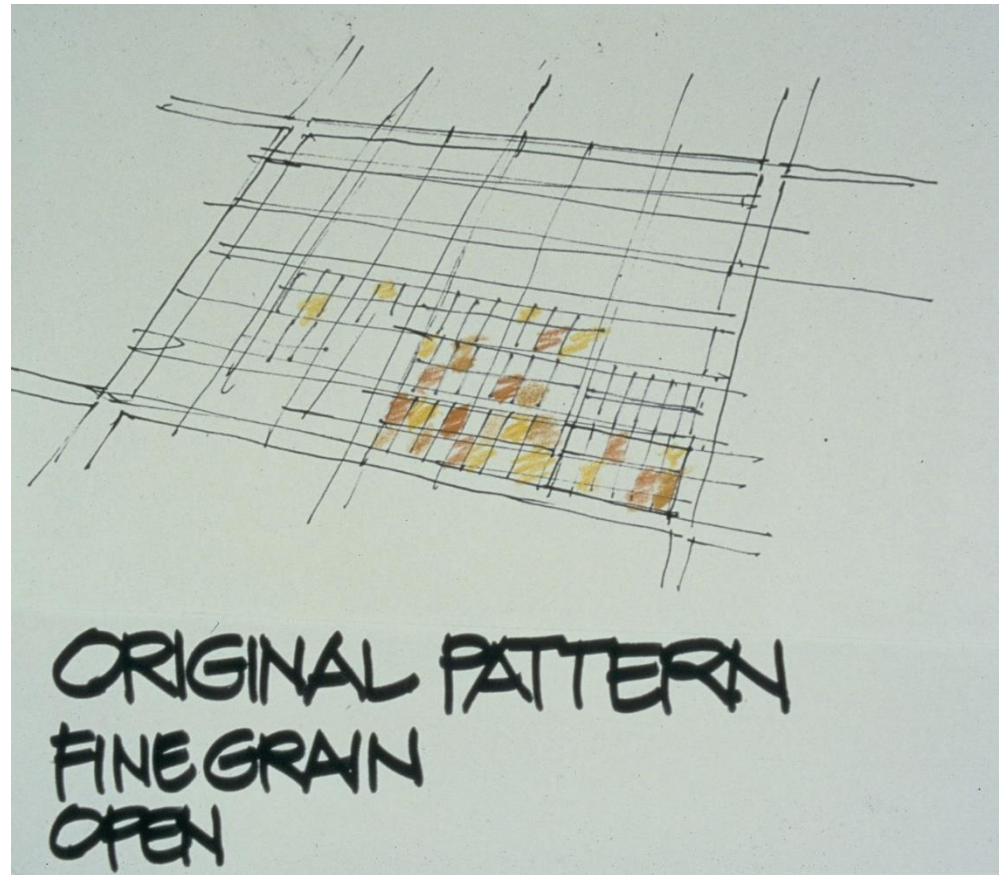
Technology begins to  
change residential  
patterns





# Original Pattern of Residential Development

Small Lots and  
Small Houses





## Typical House in Early to Mid 20<sup>th</sup> 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.

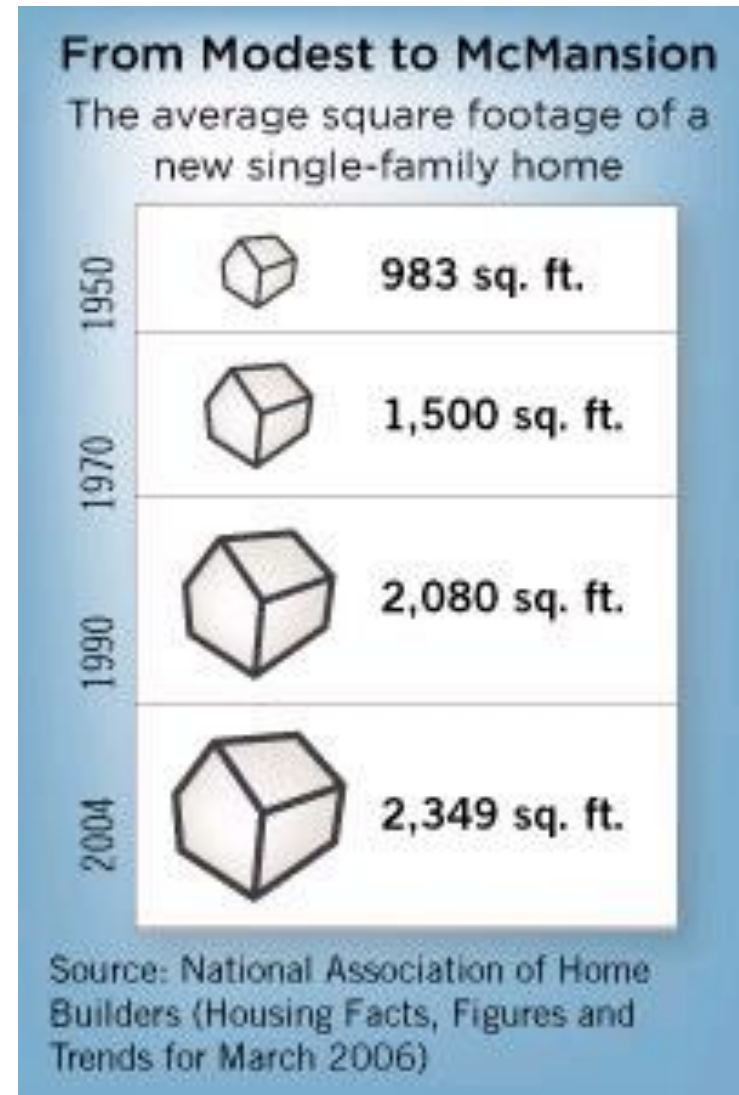






## House Size Comparisons by Year

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...

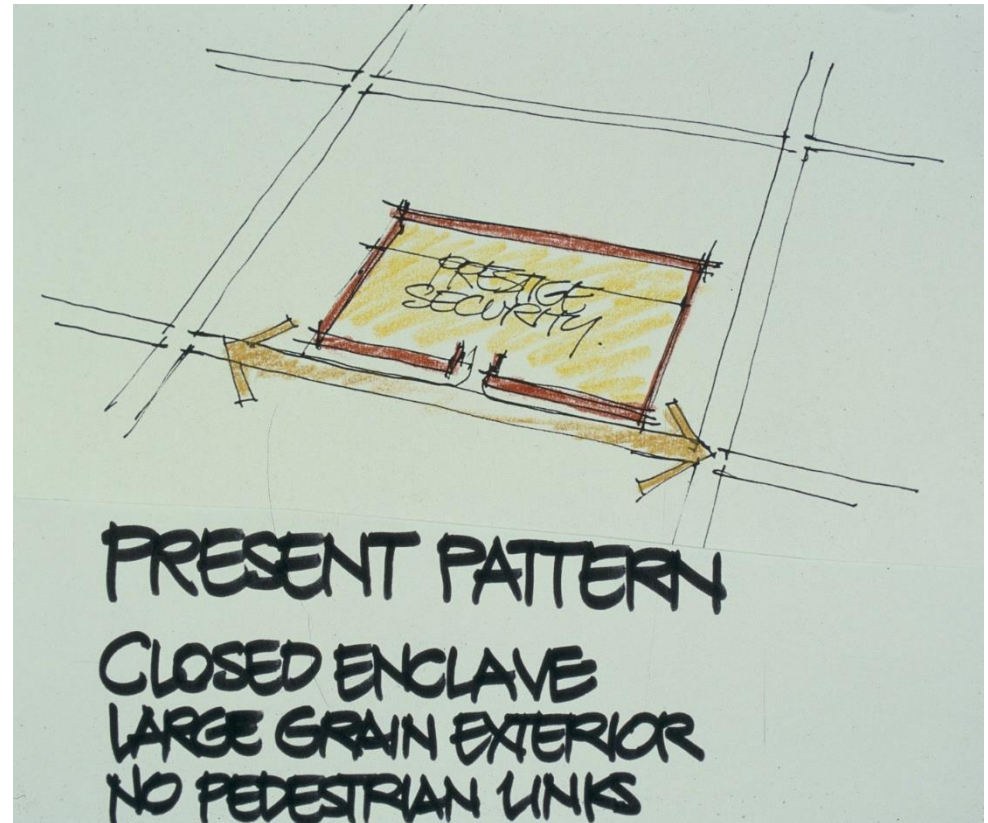
... is no longer the norm. Married couples with children have decreased from 40.3% to 23.3% of all households during the period 1970-2003.





## 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.

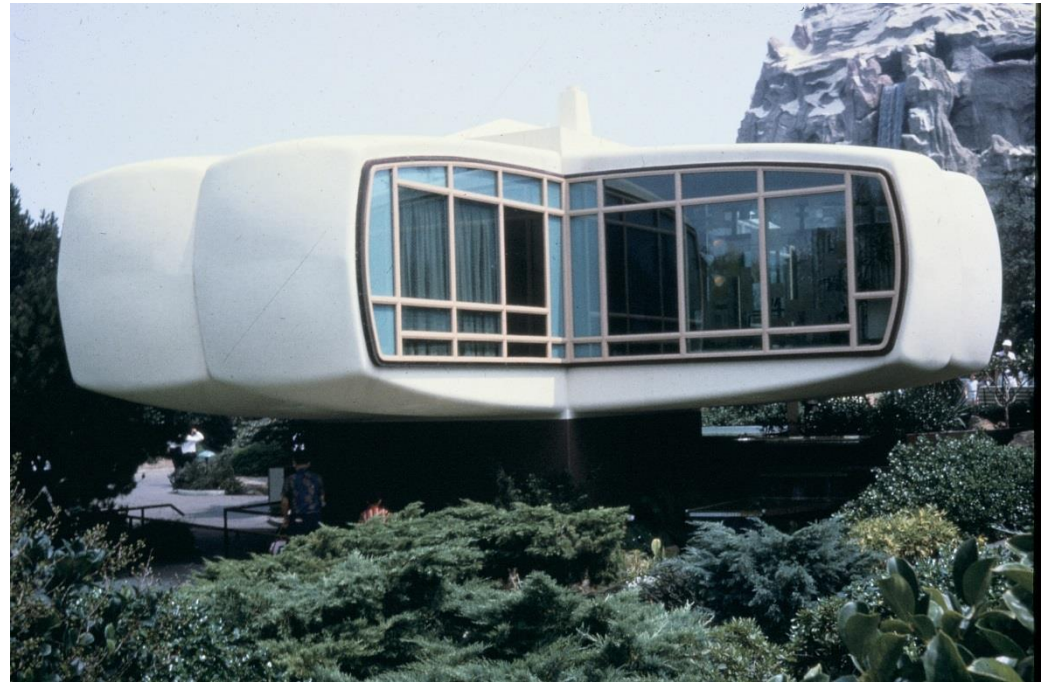






# Is Technology the Answer?

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 (?)



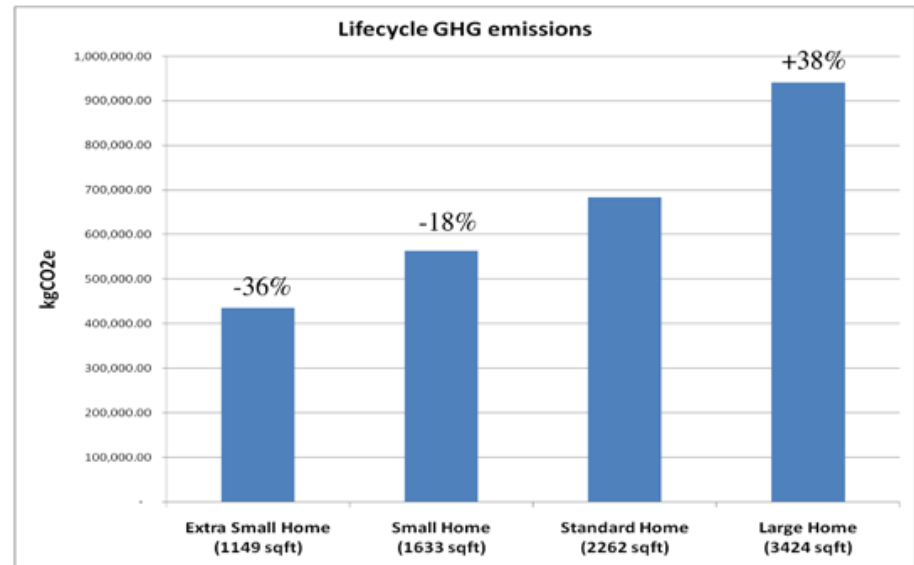
## Size Matters

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



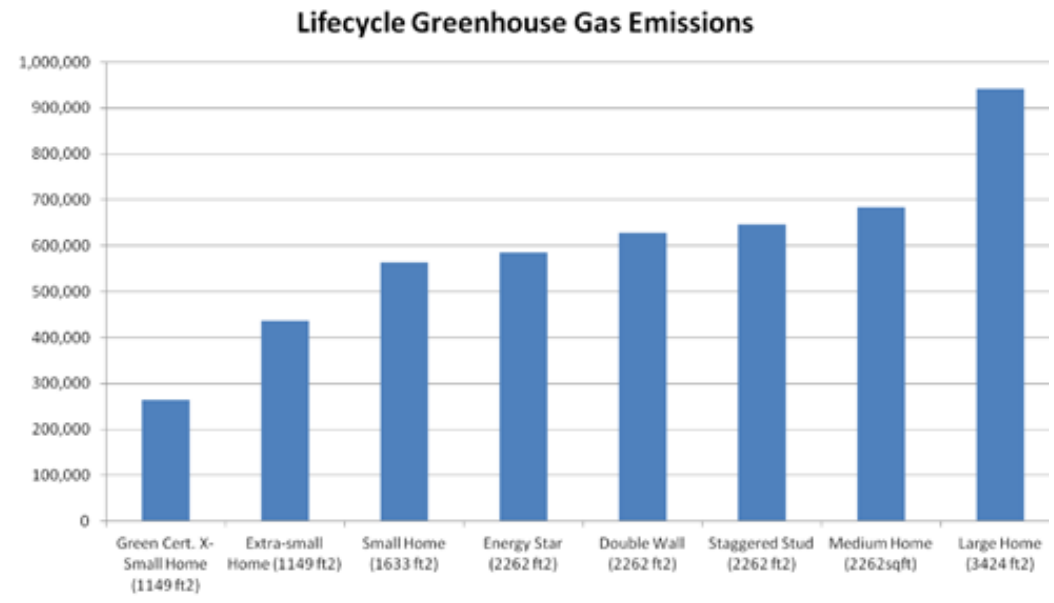
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## Size + Technology

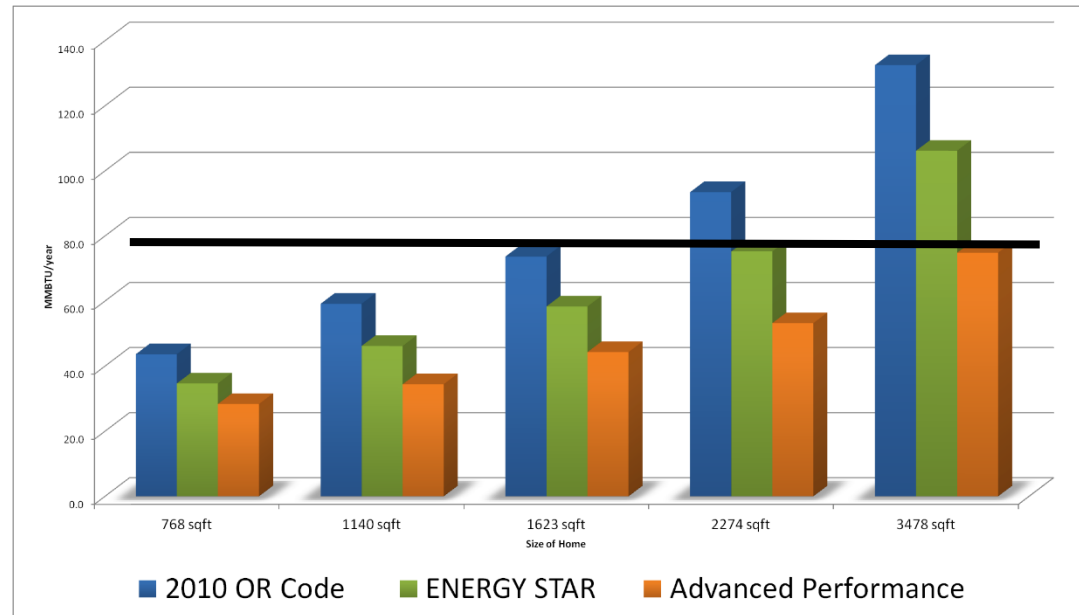
When smaller size is also used with energy saving construction techniques, lifecycle greenhouse gas emissions can be drastically reduced.





## 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.



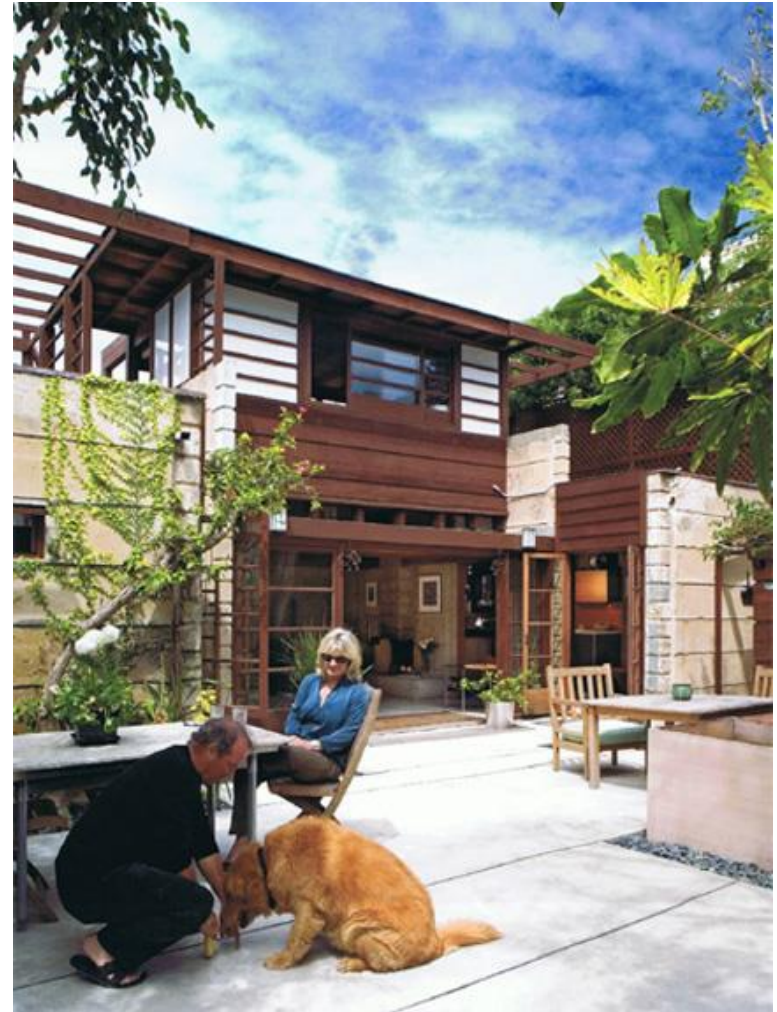
Ross Chapin, FAIA, Architect





## 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.”



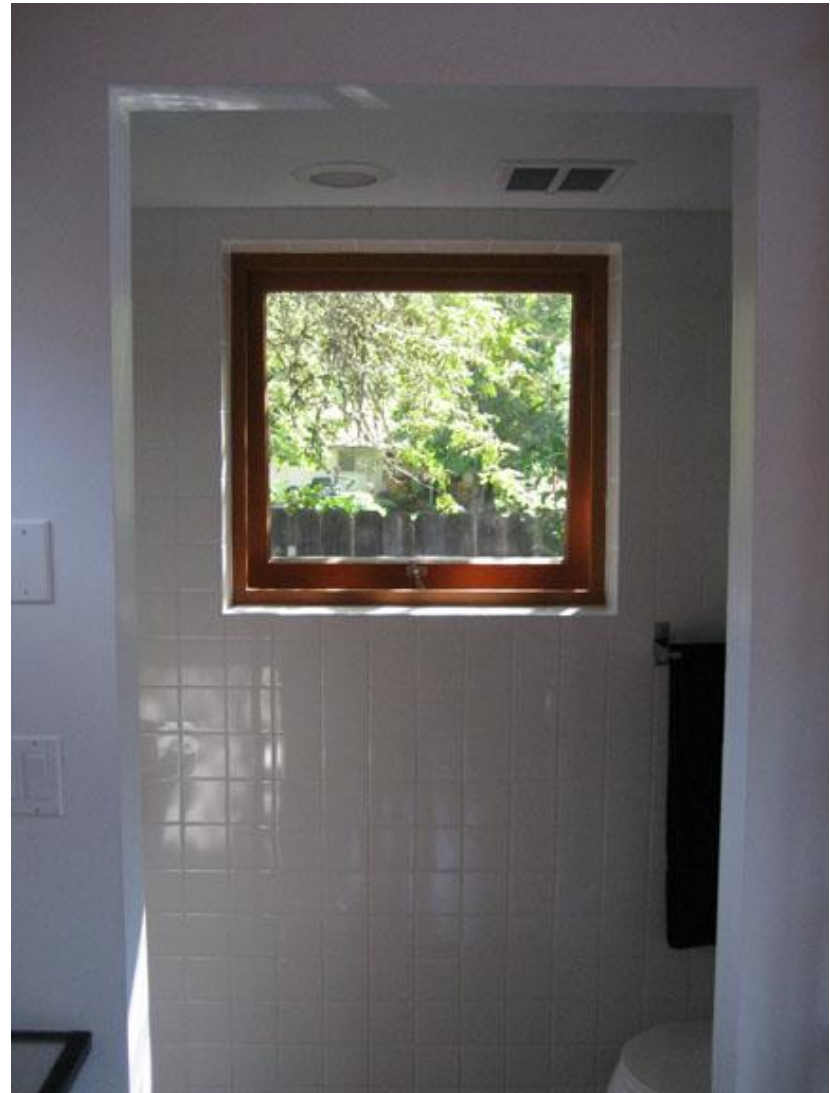
Katherine Spitz, AIA, ASLA, Landscape Architect





## 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.



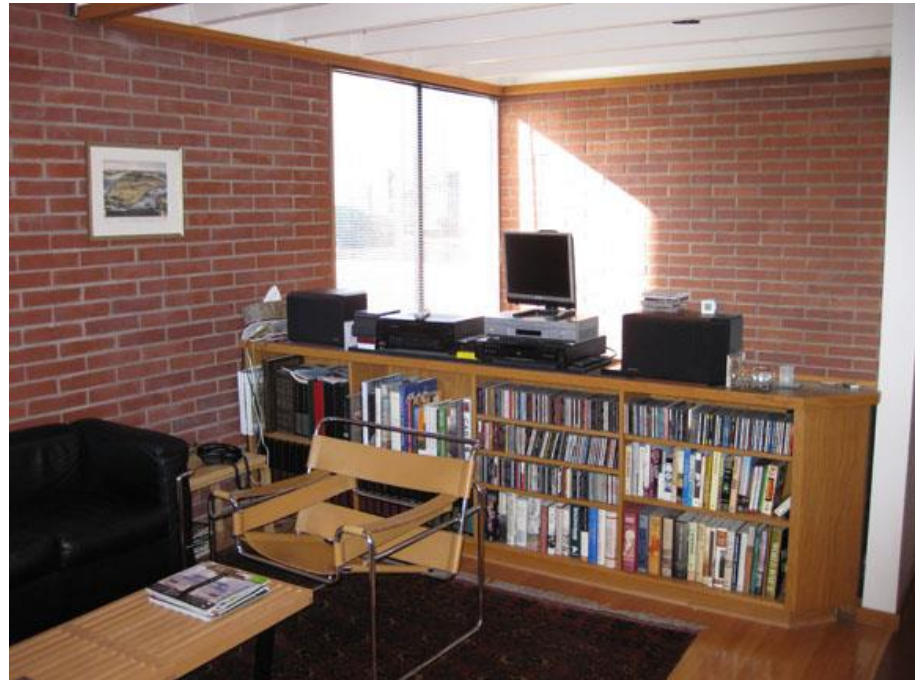
Otto Poticha, FAIA, Architect





## 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.



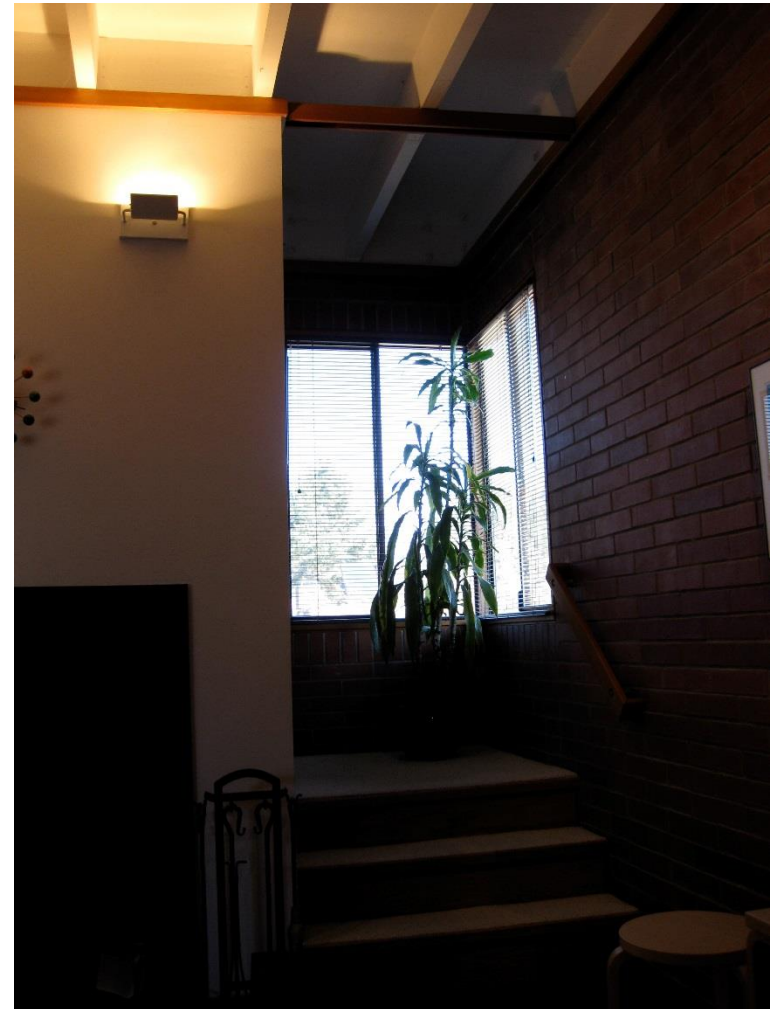
Otto Poticha, FAIA, Architect





# Dissolved Corners and Continuation of Views

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

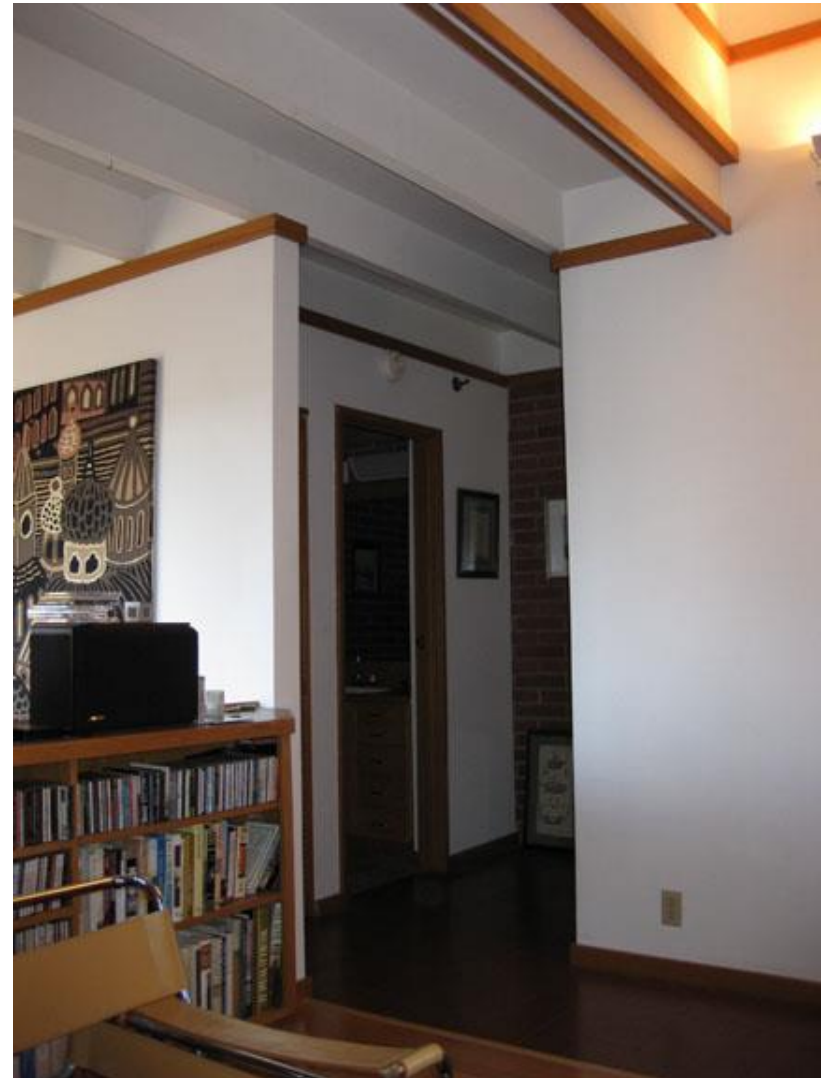


Otto Poticha, FAIA, Architect



## 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 as the polycarbonate closet door.

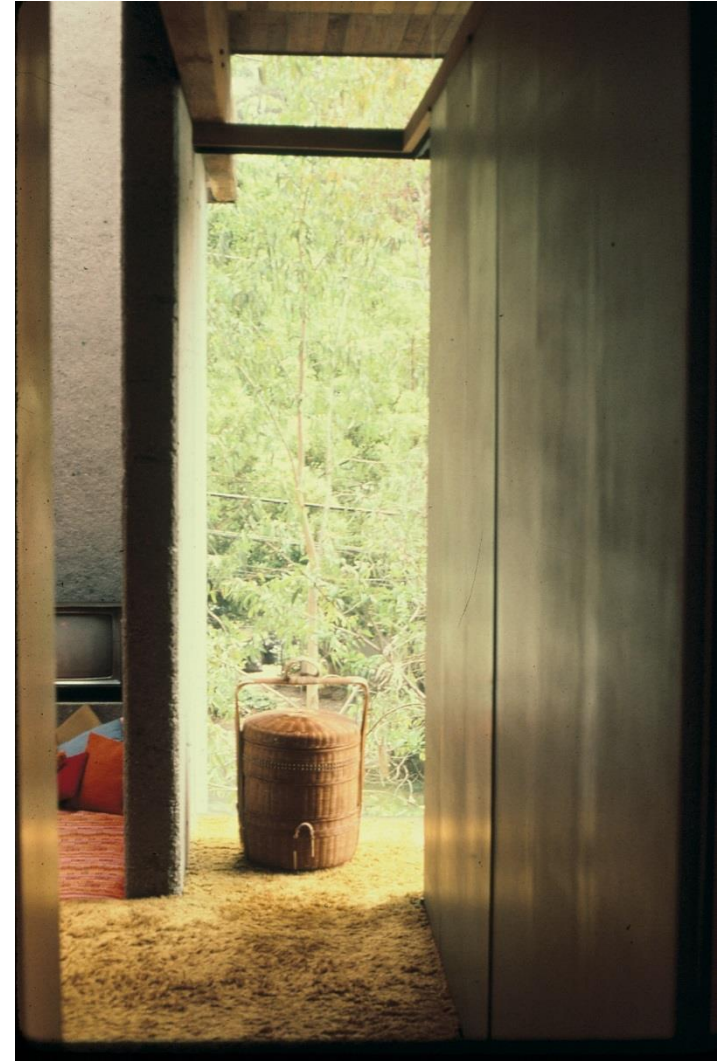


Michael Fifield, FAIA, Architect



## 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.

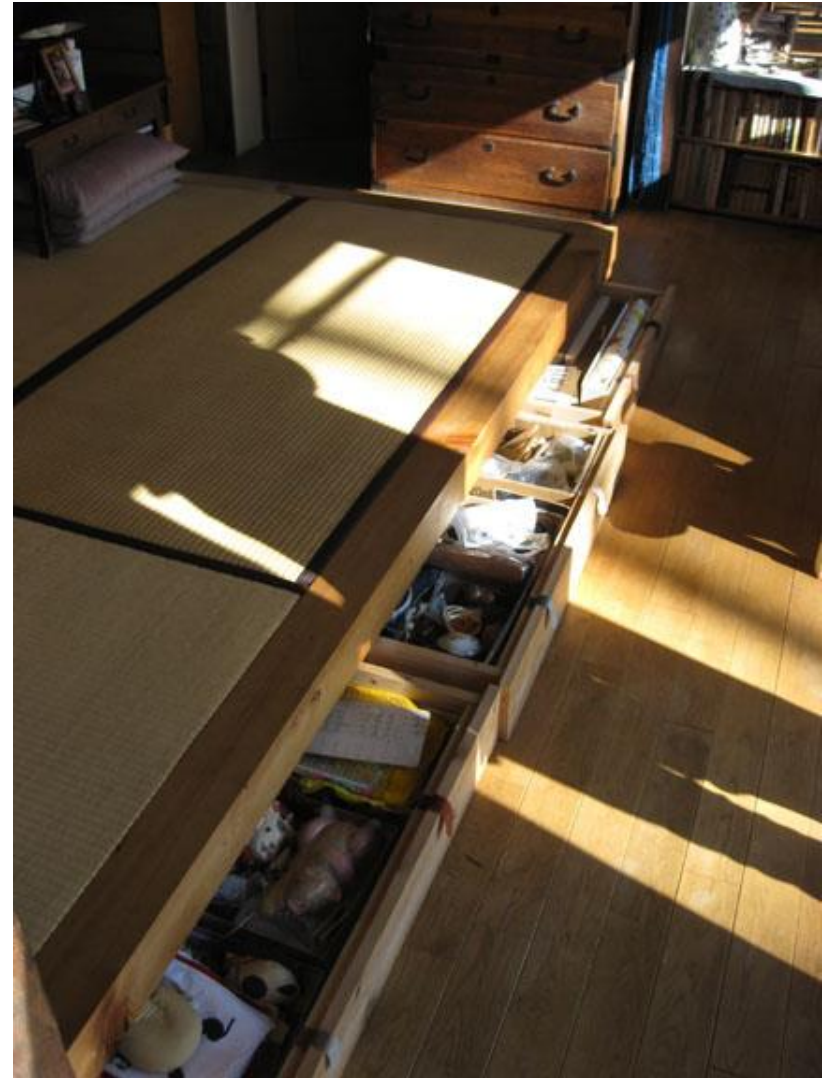


Michael Fifield photo



## 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