

City Form is inextricably linked to the characteristics, needs and desires of the fluctuating urban population. Demographics influence mobility choices, housing stock needs, required services and desired amenities. Therefore, adjustments to the physical layout and design of the city must consider expected changes in population.

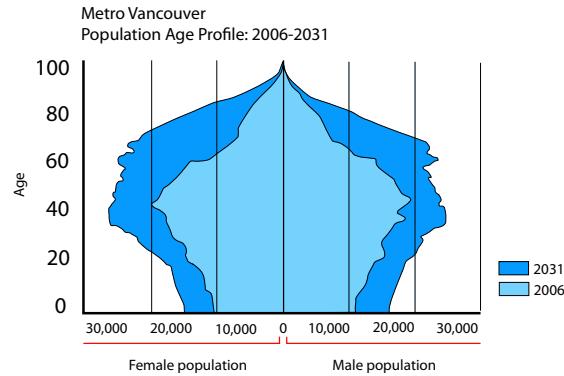
Demographics assume an increasingly significant role in Vancouver's near future. In just a decade, Canada will be home to more seniors than children, and deaths may outnumber births as soon as five years after that.¹ Such an immediate and exorbitant "graying" of the population has resulted from two main factors: the aging of the Baby Boomer generation and a persistent drop in fertility rates. As can be seen in the population pyramid to the immediate right, Vancouver can expect the same demographic shifts.

Like other North American cities, much of Vancouver's fabric has been shaped by the Baby Boomer generation, resulting in an abundance of single-family houses across the landscape. Despite the densification of the downtown core accompanied by a remarkable increase in the number of people living there, 50 percent of the city's land area remains covered by low density, single-family homes.

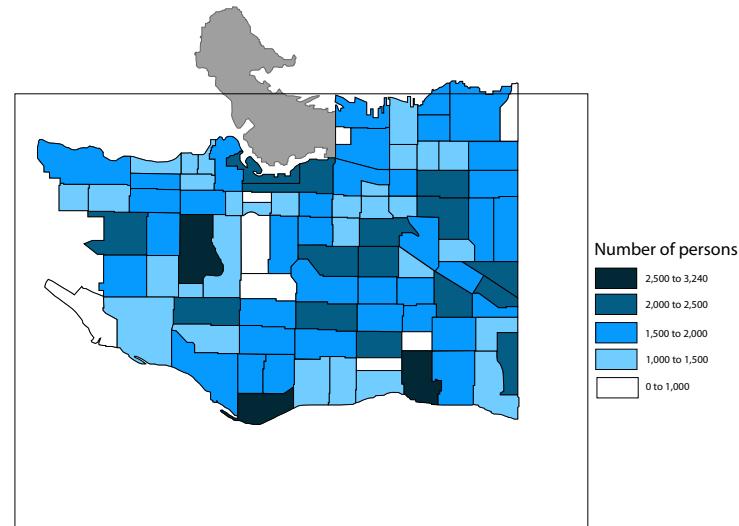
This chapter shows: how Vancouver developed into its current form and how the city can accommodate future population shifts; how basic demographic trends have influenced city form in the past; case studies for housing the elderly and the families of the future; and, how building typologies in a typical Vancouver neighbourhood will adapt to these demographic changes.

Notes:

¹ "A childless culture." *The National Post* February 20, 2006 accessed October 6, 2010 at <http://www.canada.com/nationalpost/news/story.html?id=13e220f0-b53a-4a38-bca9-66481d9b8f89>.

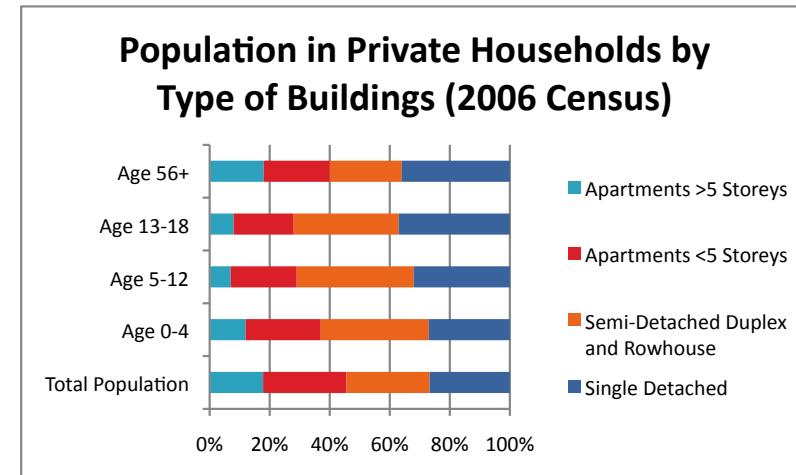


Baby Boomers Aged 40-59 Years (born 1947-1966) 2006 by Cansus Tract



Top: The top-heavy population pyramid displays projections of an aging population. (Data source: Statistics Canada, 2006 Census)

Bottom: This map communicates the significant presence of the Baby Boomer population outside of the metro core. (Data source: COV Social Indicators and Trends Report, page 39)



Top: This image shows the dominance of lower density development in Vancouver with the compact urban core visible in the distance. (Image provided by the City of Vancouver)

Bottom: The graph depicts the proportion of each age group residing in the identified housing type. (Data source: COV Social Indicators and Trends Report, page 50)

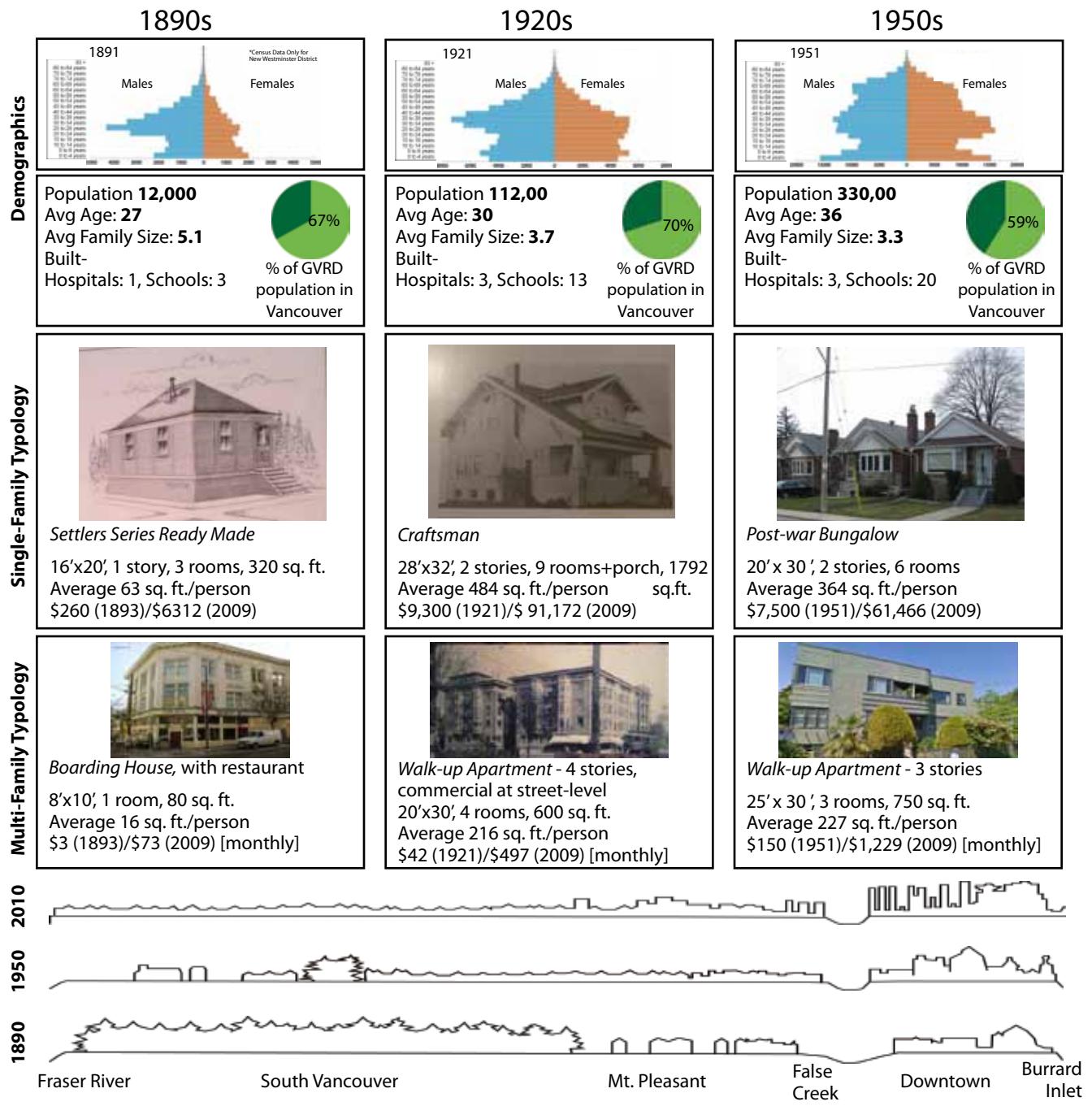
city form and DEMOGRAPHIC shift

3.0

TEAM MEMBERS: Nicci Theroux, Paula Livingstone, Margaret M. Soulstein, Jingjing Sun, Tate White

Design considerations for accommodating future populations:

- Demographic shifts do not necessitate drastic changes in neighbourhood form;
- There is potential in the existing fabric to accommodate future populations;
- A city designed for the elderly can benefit all age groups and is synergistic to a kid-friendly city;
- Although the structures of families will change, housing typologies can adapt instead of completely changing;
- Multi-generational living will become more prevalent; and
- Focus will be on the incorporation of "gentle" or "invisible" density to house future populations.



city form and population **FORM** 3.1

TEAM MEMBER: Margaret M. Soulstein

The influence of demographic trends on city form, 1890 - current:

Population characteristics impact the form of the city, and changing the form of the city impacts the decisions of the population.

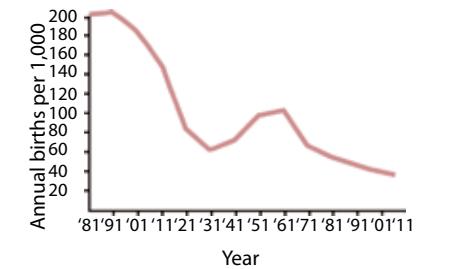
Changes to one area of the city do not happen in isolation of space and time. By looking at the history of the city, it is clear that population characteristics influence city development. It is also clear that the character of Vancouver's diverse neighborhoods is strong. As we turn towards the future, it is imperative that we consider the legacy of Vancouver's history and the character of its neighbourhoods.

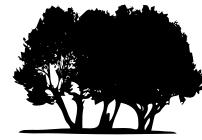
KEY PLANNING DECISIONS

- 1910 City of Homes
- 1920 Bartholomew Plan-1st city to adopt comprehensive zoning
- 1952 Planning Department est. zoning, allows 6+ story buildings in Kitsilano, Marpole, Kerrisdale
- 1985 Re-zoning of the West End, switch to a city of renters

- 1996 Expo Land developed in large parcels, return to a city of owners podium point towers
- 1996 GVRD Livable Region Strategic Plan
- 2010 Eco-Density

Number of births per 1,000 women aged 15-49 in British Columbia, 1881-2006





Green space



Affordability



Accessibility



Civic & Social Participation



Services



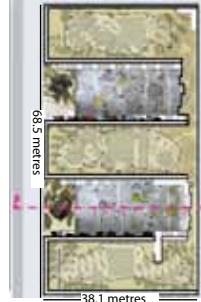
Transportation



Health services



Respect and Social Inclusion



HIGH DENSITY Multi-Generational Mixed-Use Housing

FSR: 2.0 ->

Tehran Vertical Garden
Sara Kamalvand and Claude Boullivraye de Passillé, 2009
19 575m² (estimate)

Features:

- Vertical vegetation fits into city form and provides access to nature
- Affordable housing
- Access to health, community and leisure services, public transportation

This high density housing prototype encourages density in the city centre and along arterial corridors. Higher density equates to lower energy consumption. Most of the facade surfaces are covered with rolling vegetated panels. Residential units, have their own balcony for personal ventilation control, shading and gardening.



MID DENSITY Multi-Generational Mixed-Use Housing

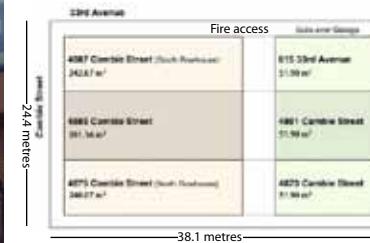
FSR: 1.20 - 2.0

Urban Resonance – Flickering Life
Alkmaar, Netherlands
Proposal by Claude Boullivraye de Passillé

Features:

- Active public space
- Transformative communal and private space
- Integrate public services and amenities at ground level

The core building repeats itself in several permutations at different scales, never exceeding 5 storeys. Each building is oriented on a north-south axis to catch westward winds, passively cooling the interiors with natural ventilation. Adjustable interior panels adapt space to meet occupants needs.



LOW DENSITY Senior housing

FSR: 1.0

Rowhouse Development
Jeune + frauenberger design
Vancouver
929.50 m²

Features:

- Age in place with private ownership
- Access to nature at street level + roof top
- Opportunity for live-in caregiver
- Community support and health services embedded in neighbourhood structure
- Proximity to public transportation

Rowhouses provide a seamless layer of density into the single family neighbourhoods typology. The lots are full length; each property is self-contained; only the party wall is held in common. The suite over the garage is completely independent from the rest of the house and provides affordable housing for caregivers.

case studies:

HOUSING FORMS for the elderly of the future

3.2

TEAM MEMBER: Nicci Theroux

Design considerations for housing forms for the elderly:

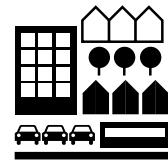
Ageing in place

The vast majority of seniors aged 65 and over live in private households (*Statistics Canada*). By 2050, roughly 25% of the total population will be 65 and older. In order for communities to accommodate an aging population, this cohort must be allowed every opportunity to age in place. The World Health Organization has determined that an aging-friendly city provides and designs for:

- Accessible Outdoor Spaces and Buildings
- Affordable Housing
- Reliable Public Transportation
- Respect and Social Inclusion
- Social Participation
- Civic Participation & Employment
- Access to Community Support & Health Services

Changes in demographics do not necessitate a change in the design of neighbourhood form. An aging population can be accommodated within the existing fabric.

An appropriate design response for an age-friendly community benefits people of all ages, regardless of whether they are children, youth, women or older adults.



Aggregation



Proximity



Daycare Schools



Services



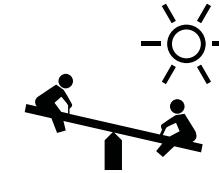
Affordable housing



Public Transportation



Green space



Playground



HIGH DENSITY Family housing

FSR: 2.0 ->

The Zuidkas building
Paul de Ruiter architect
Amsterdam, The Netherlands.

This mixed-used building is designed to address several sustainability issues such as CO₂ reduction, energy savings, and public health. The project proposes a functional mix in the building that is far from ordinary: homes, offices, a school, parking facilities, retail, restaurants, a park and a biogas electrical plant. All of these functions are linked by a glass construction envelope that encompasses various kinds of greenhouses. The objective was to make an intelligent building that concentrates different activities and minimizes energy consumption.



MID DENSITY Family housing

FSR: 1.20 - 2.0

Islington Housing
Levitt Bernstein architect
Islington, London, UK.

Affordable and flexible homes for families in central London. This project emphasizes sustainability and creates spacious living conditions, including private and communal outdoor space. These outdoor areas include herb gardens and fruit trees for cultivation. Homes include features such as green roofs, photo-voltaic panels and rainwater harvesting. The first site to be developed will be a small 'infill plot' of land in a built up part of Finsbury Park, which is typical of other potential sites in inner London.



LOW DENSITY Family housing

FSR: 0.35 - 1.2

Harvest Green Project-02
Romes Architects.
Vancouver, Canada.

The project, designed as an entry to Vancouver's "2030 Challenge" hopes to solve energy and food security problem in future increased densification. It proposes to overlay a new green energy and food web across residential neighborhoods and laneways within the city. Laneways will be transformed into green energy and food conduits, where energy and food is 'harvested' via proposed micro laneway live-work homes. The design includes ModPods, mobile prefab laneway homes that can be sited in multiple configurations and sizes.



case studies:

HOUSING FORMS for the families of the future

3.3

TEAM MEMBER: Paula Livingstone

Design considerations for housing forms for families:

The competition projects in this series of case studies present innovative examples for future family housing typologies. The selected projects can easily assimilate into Vancouver's existing neighborhood fabric.

- Consider the most important issues that housing typologies for families of the future: aggregation (mixed use), proximity to services, access to daycare and schools, access to green space and playgrounds, affordability, and reliable public transportation.
- Adapt Vancouver's housing typologies to accommodate the requirements of new families to address the change in family composition from 2.9 (census 2006) to 2.2 people per family in 2050.
- Cluster future family housing in different housing types in order to enhance flexibility and provide affordability
- Though each of the presented projects tries to solve all the issues related to sustainability on their own, focus individual projects on "making the whole greater than the sum of its parts"

Typical Vancouver Neighbourhood Transect - projections of evolving typologies for 2030

city form and demographic shift

	241 W.17th Avenue Zoning: RS-7 UPH: 20 FSR: 0.88	343 W.16th Avenue Zoning: RT-5 UPH: 30 FSR: 0.75	320 W.15th Avenue Zoning: RT-6 UPH: 66 FSR: 0.83
Typology (2010)	Single Family Home 	Duplex 	Laneway Infill
Section - Elevation 2030 Occupancy Type			
Plan			
Analysis (2030)	<p>↑ Increase from 20 to 60 UPH from single to triplex</p> <p>Secondary suites (including basement suites) were added to the single detached dwelling. Elderly households can move to the first floor or basement and rent out the upper floor for younger generations.</p>	<p>↑ Increase from 30 to 60 UPH from duplex to fourplex</p> <p>Although under the current regulation secondary suites are not allowed in duplexes, the basement suite has great potential for adding invisible density to accommodate the increasing elderly population.</p>	<p>↑ 66 UPH 8 units being added</p> <p>On this site, two sizable laneway houses were built on a single-family dwelling sized lot, which adds 7 individual units to the existing density. Laneway housing is a more affordable way to house elderly parents or their caregivers.</p>

3228 Cambie Street Zoning: C-2 UPH: 234 FSR: 2.4	100 W.15th Avenue Zoning: RT-5
Double-loaded apartment building with retail at grade 	Elementary School
<p>↑ remain at 234 UPH</p> <p>The 117 suites in this building are 1 - 2 bedrooms, which is a suitable size for both individual elderly persons and elderly couples. The mixed-use building also provides direct access to its commercial ground floor for elderly residents.</p>	<p>retrofit into a community center</p> <p>With its inner residential neighborhood location, the elementary school can be retrofitted into a community centre for the elderly as the existing school spaces and facilities are easily transformed into offices and shared spaces.</p>

Occupancy Type

- senior (>65)
- single/couple (<65)
- community centre for elderly

Amenities

- Community and Social Interaction
- Accessibility to Services
- Green and Open Space
- Proximity to Transit

a city with ONLY ELDERLY? 3.4

TEAM MEMBER: Jingjing Sun

Accommodating the elderly of the future:

Canada's population is aging. By 2056, the median age is expected to reach 46.9 years, which is 20 years older than it was in 1956. The demographic dependency ratio for the senior cohort in 2006 was just over 5 working age people (15 to 64 years) for each person 65 years and older. In 2056, it will be only 2.2 working age people for each person aged 65 years or over (based on the medium growth scenario conducted by Statistics Canada).

This demographic trend leads to a re-evaluation of Vancouver's current housing stock and forms. In this study, an urban transect was drawn through Vancouver's city fabric between 15th avenue and 17th avenue across Cambie street. Based on the buildings found in this transect, a typical Vancouver neighbourhood housing typology is defined and further developed. The main goal of this section is to explore various type-specific design strategies to accommodate the increasing elderly population through gentle densification or the creation of invisible density - to achieve greater affordability, flexibility and accessibility for the future.

Typical Vancouver Neighbourhood Transect - projections of evolving typologies for 2060

	241 W.17th Avenue Zoning: RS-7 UPH: 20 FSR: 0.88	343 W.16th Avenue Zoning: RT-5 UPH: 30 FSR: 0.75	320 W.15th Avenue Zoning: RT-6 UPH: 66 FSR: 0.83
Typology (2010)	Single Family Home 	Duplex 	Laneway Infill
Section - Elevation 2060 Occupancy Type			
Plan			
Analysis (2060)	<p>↓ return to 20 or 30 UPH triplex to single or duplex</p> <p>Desire for detached, spacious housing will return to house larger families. A formerly retrofitted triplex is further adapted to once again become a single family home or possible a duplex if more density is required.</p>	<p>→ remain at 60 UPH - retain optional basement suite</p> <p>Original duplex units transition perfectly for families who can have the choice to rent out basement suites to singles, couples or a nanny to improve affordability. Larger families can retain the basement for their own use.</p>	<p>→ remain at 66 UPH a versatile form of density</p> <p>This unique site began as a sizable laneway infill and can transition into the future without requiring much alteration.</p>

	3228 Cambie Street Zoning: C-2 UPH: 234 FSR: 2.4	100 W.15th Avenue Zoning: RT-5
Typology (2010)	Double-loaded apartment building with retail at grade 	Elementary School
Section - Elevation 2060 Occupancy Type		
Plan		
Analysis (2060)	<p>↓ remain at 234 UPH or enlarge few units to slightly lower density</p> <p>The 117 suites in this building are 1 - 2 bedrooms meaning that multiple units require being grouped into one to accommodate families with children. This is best done to ground level units facing away from the arterial.</p>	<p>reverse retrofit back to a school</p> <p>The former elementary school is retrofitted back into one after serving as a community centre for the elderly. School facilities are easily adapted to be shared spaces, but can retain their ability to return to their original function in the future.</p>

Occupancy Type

- family with children
- single/couple (<65)
- senior (>65)
- school

Amenities

- Community and Social Interaction
- Accessibility to Services
- Green and Open Space
- Proximity to Transit

a city for NEW FAMILIES? 3.5

TEAM MEMBER: Tate White
Accommodating the families of the future:

A decline in the share of the under 15 age group will accompany the significant aging of the population expected over the next five decades. However, this dearth in the younger component of the population is projected to be concentrated over the next three decades. As the demographic bulge of the elderly decreases and the presence of children increases, Vancouver's housing stock and forms will need to adapt to the reintroduction of families to the composition of the population. The invisible density added in earlier decades will be retrofitted to house and serve families of all sizes within the existing fabric. Adaptability, accessibility and affordability will be paramount to this process:

- Demographic changes will require different kinds of spaces and living arrangements. Flexible housing will provide an integral solution.
- Family-oriented services and amenities will need to be integrated within housing. Accessibility to childcare, safe open space and play areas will be central concerns.
- Subsequent changes to housing form will need to make considerations for how to strategically maintain affordability.