



Smart Growth on the Ground

FOUNDATION RESEARCH BULLETIN: Squamish

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No. 1
March, 2005

AFFORDABLE HOUSING

1.0 Introduction

What is Affordable Housing?

Affordable housing is generally defined as households in which no more than 30% of before-tax income is spent on shelter. CMHC uses the measure of Core Housing Need to provide an indication of the need for affordable housing in a given area. Households would fall into Core Housing Need if they were unaffordable, in poor condition or unsuitable in size.

Affordable housing need in Squamish

In 2001, 11% of Squamish households (535) fell into the Core Housing Need. Out of these households, 43% (230) are family households, 32% (170) are non-family households and 23% (125) are seniors.

Table 1: Number, Average Income, Average Shelter Costs, and Average Shelter to Income Ratios for Rented and Owned Households based on need in 2001 in Squamish¹

	Number	Average Income (\$)	Average Shelter Cost (\$)	Average Shelter to Income Ratios (STIRs)
Total	4,910	65,201	922	21
Total (Owned)	3,610	72,493	968	19
Total (Rented)	1,300	44,951	793	27
Households Not in Core Housing Need (Total)	4,380	70,122	1,354	30
Households Not in Core Housing Need (Owned)	3,380	73,405	1,428	29
Households Not in Core Housing Need (Rented)	990	66,556	1,240	34
Households in Core Housing Need (Total)	535	19,779	818	50
Households in Core Housing Need (Owned)	230	22,779	1,006	54
Households in Core Housing Need (Rented)	305	17,572	666	47

Increase supply of affordable housing

There are three main ways housing can be made more affordable in Squamish through design: offsetting development costs, improving the stock of rental housing and reducing operational costs. Although there are many policy tools available to municipalities to improve affordable housing, and Squamish is currently in the process of preparing an Affordable Housing Strategy policy document to examine these tools, the strategies outlined below are specific to *design* measures that can increase affordability.

2.0 Design solutions to offset the cost of development

Development costs are comprised of the cost of land, building materials, municipal service charges and labour. Finding solutions to offset these costs will lower the overall cost of

Table 2: A comparison of an average Kitsilano and Squamish RS-1 minimum lot sizes³

	Kitsilano Lot	Squamish Lot ¹
Lot Size	335 m ² (3630 ft ²)	690 m ² (7,427ft ²)
Lot Width	10 m (33 ft)	18.3 m (60 ft)
Lot Depth	33.5 m (110 ft)	27.4 m (90 ft)
Net Density	17.5 du/ hectare (7.75 du/ acre)	14.5 du/ hectare (5.87 du/ acre)

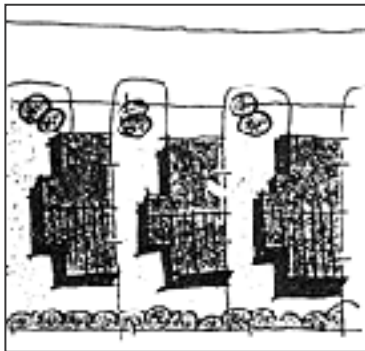


Figure 1: Zero lot line

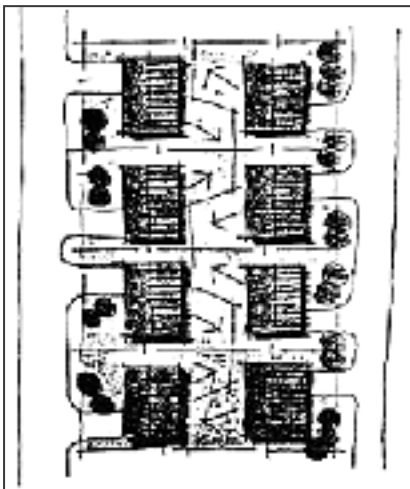


Figure 2: Zipper lot

development, making homeownership more affordable. Smaller lot sizes, alternative building forms, building incrementally, creating denser developments and using prefabrication are a few design solutions applicable to Squamish that are discussed below.

Smaller lot sizes

One way to create more affordable housing is to reduce the cost of land by using smaller lot sizes. Squamish zoning bylaw currently stipulates a minimum lot size of 690 sq m (7,427 sq ft) for lots in the Residential 1 Zone, or 800 sq m (8610 sq ft) if it is a corner lot.² Minimum lot sizes in Squamish fall between a medium size lot and small lot. Table 2 compares the minimum Squamish RS-1 lot size with an average Kitsilano lot.

There are several ways to create developments with smaller lot sizes that maintain the appearance and amenities of a single detached dwelling, including useable yard space. The simplest approach is to build smaller houses on narrower lots with a block-style layout. Three other approaches that would be applicable to Squamish - zero lot line, zipper lots and wide-shallow lots - are explained below.

Zero Lot Line

The house is situated on one of the side lot lines, concentrating the open yard space to one side of the house. This creates the illusion that the lot is much larger, provides more useable yard space and preserves privacy by creating more space between houses. This strategy works well in new subdivisions with lot width frontage of 12.2 m (40 ft) or less.⁴

One problem encountered with narrow lot design and zero lot line layouts is that the street frontage can become dominated by garages. Locating detached garages located off of a rear access lane eliminates the need for front driveways, creates a pedestrian oriented streetscape, and provides more “eyes on the street” through unobstructed views of the street from the house.⁵

Zipper Lot

The rear lot line jogs back and forth, varying the depth of the rear yard and concentrating usable back yard space on one side of the lot. Using this configuration, it is possible to achieve densities of 37 du/hectare (15 du/acre), which is the same as on-street townhouses.

Wide/Shallow Lot

In wide/shallow lots, the longitudinal axis of the house runs parallel to the street, creating the illusion of a larger dwelling. Also known as “theatre lots”, open space is situated in the front and rear of these houses. In Toronto, typical theatre lots range from 9 m (30 ft) wide to 22.9 m (75 ft) deep, compared to more conventional lots that are 33.5 m (110 ft) to 39.6 m (130 ft) deep.



Figure 3: A duplex on a wide shallow lot

Building typology

Building form and design have implications for affordability. Housing forms alternative to traditional detached single family housing are more affordable for several reasons including: reduced cost of land, building materials, and municipal infrastructure charges. Table 2 outlines cost savings for lot size, roof area and perimeter walls that can be achieved with alternative housing forms.

From an operational standpoint, semi-detached houses, duplexes, triplexes, quattroplices, townhouses, stacked townhouses and walk-up apartments cost less to heat. This is because as the density of the built form increases, perimeter wall and roof areas decrease, reducing exposed surface area for heat loss.

One challenge with this design solution is to gain acceptance for denser building forms in a social context where single-detached housing is the norm. However, there are ways to incorporate multi-family housing in a way that the flavour and rhythm of a street with single family housing is maintained.



Figure 4: An example of a semi-detached house

Semi-detached

In semi-detached housing, one wall is shared with the neighbouring house. This reduces the lot size by 18% and perimeter wall costs per unit by 33%. Typically located on lots ranging from 300 m² to 306.6 m² (2,475 ft² to 3,300 ft²), semi-detached houses have both a front and rear yard.

Duplex and Triplex

There are two units in a duplex, with one stacked above the other. Entrances to units are generally located side-by-side. Triplexes are similar to a duplex (but with three units), most often stacked. A 50% saving in roof and foundation areas, curb lengths and lot areas are achieved with the duplex style, whereas in the triplex these savings are 66%.

Quattroplice

With the appearance of a large single-detached house, quattroplices contain 4 units. Two of these units are located in the front and two are in the back, each with its own secured front and back yard. Quattroplices can fit comfortably on a 20 m X 40 m lot (66 ft X 130 ft). This style results in a 50% saving in lot area, curb length, roof area and foundation area, and a 35% saving in exterior wall perimeter.

Townhouses

In townhouses - also known as row housing - dwelling units share two walls. Units are typically narrow, ranging in width from 6.7 m to 9.8 m (22 to 32 ft) and have both a front and rear yard. On street row houses are usually situated on 167 m² to 209 m² lots (1,800 to 2,250 ft²). To maintain a pedestrian oriented streetscape, it is advisable that parking requirements are met with detached garages on rear access laneways. Townhouses are the most popular type of housing between the single family dwellings and apartments or multi-family dwellings and can be bought or rented. This style results in a 33% saving in lot area and front curb length, and a 70% saving in exterior wall perimeter.



Figure 5: An example of a townhouse



Figure 6: An example of a walk-up apartment

Walk-Up Apartments

Walk-up apartments were a Parisian invention that has been imported to North America. With this style of housing, dwelling units are either stacked one above another, positioned side-by-side, or front-to-back with one shared central entrance and staircase. Similar to the stacked townhouses, a variety of dwelling units can be accommodated: bachelor, one-bedroom, two-bedroom and three-bedroom units. In place of private yards for each unit, walk-up apartments typically have a common amenity area with each dwelling unit having a balcony or terrace. Since walk-up apartments are generally 3 stories and do not have an elevator, they are less expensive to build per square metre than a high-rise apartment. Walk-up apartments have similar savings to stacked townhouses.

Stacked Townhouses

In stacked a townhouse, living units are layered vertically over each other while maintaining a street entrance for each unit. Stacked townhouses usually have three full storeys and a basement. There are a range of dwelling unit sizes that can be accommodated with stacked townhouses - from 46.5 m² (500 ft²) basement bachelor units, to 11.5 m² (1,200 ft²) two or three bedroom dwelling units. This housing form is suitable for two family units on top of each other or a smaller bachelor unit placed over or below the family townhouse. Stacked townhouses have a 50% saving in foundation and roof areas, a 33% saving in lot area and curb length, and a 70% saving in exterior wall perimeter.

Density

Higher density developments are created using smaller lots, and more compact building that contain more units per area. Infrastructure charges for a specific area are distributed among more units, leading to less cost per unit in higher density communities. For example, denser building forms require fewer service trenches per unit, saving approximately \$3,000 for each trench eliminated. Shared parking facilities offer further savings by reducing the need for paved areas and curb cutouts.

Building incrementally

One strategy to offset the cost of development is to build houses incrementally. With this strategy, houses are built with one or two unfinished floors. Plumbing, wiring, ductwork and structural reinforcement would be required for finished liveability. Homeowners live in the finished portion of the house and complete the unfinished spaces when their financial situation allows. These homes are affordable because they start off as a small compact building that is built on a small lot. One of the most well known incremental homes is the Grow Home. Developed at McGill University in Montreal, there are over 10,000 units constructed in North America. In 1991, Montreal Grow Homes sold for \$70,000 to \$93,000, compared to the average selling price of a similar sized home at \$110,000.

Prefabrication

Prefabrication refers to the use of factory assembled housing or building components. This increases affordability since materials are purchased in larger quantities, assembled with mass production techniques, which reduces labour costs for on site construction. Prefabrication takes three forms: the prefabrication of housing components such as windows, doors, and cabinets, modular housing and manufactured housing. With modular housing, prefabricated sections are assembled onsite and with manufactured housing, the entire house is constructed in a warehouse and shipped to the site intact. Although savings will vary, manufactured housing costs approximately 35% less than conventional construction.

3.0 Increasing the supply of rental housing

One way to increase the supply of rental units is to encourage mixed use developments with residential dwellings above ground floor commercial. Traditionally, dwellings above ground floor commercial were an affordable supply of rental units, however the trend over the last few decades has been to build one level commercial developments.

Secondary suites

Also known as accessory apartments, second units, granny flats, in-law suites and basement apartments, secondary suites are private, self-contained units located within an existing dwelling. Secondary suites have their own bathroom, kitchen, living and sleeping areas, but usually share laundry, storage space, parking and the yard. Secondary suites typically have lower rents than apartments, making them a more affordable choice for tenants. Another way secondary suites increase affordability is by providing rental income to first time homebuyers. They also allow older households that no longer require a large dwelling to decrease their living space while providing the funds to maintain the entire dwelling. Either designed into a building at the outset, or created through renovation, secondary suites are an easy way to increase density while maintaining the look and feel of single family housing from the street. Currently, the use of secondary suites is permitted by the 1995 Squamish Zoning Bylaw No. 1342 in single family dwellings serviced with community water and sewer systems, limited to 65 m² or 40% of net floor area.

4.0 Reducing operational costs

Creating walkable communities serviced by public transit

Designing denser, more walkable, complete communities well served by transit can reduce the need for residents to own a vehicle. With the average annual cost of operating a car in Canada estimated at \$9,500⁶, this can greatly reduce monthly costs.

Providing opportunities for urban agriculture

Providing opportunities for urban agriculture is way to reduce food costs. With the average BC household spending \$6,800 on food each year growing fresh produce would offset some of those costs.

Energy efficient design

Constructing energy efficient homes, such as homes certified to the R-2000 standard, reduces monthly fees, ultimately making the home more affordable. Although energy efficient homes can cost up to 10% more to build, this cost is recaptured in lower energy bills. Through better insulation and more efficient equipment, R-2000 homes use about 30% less energy than homes designed to code.

5.0 Conclusions

As this information bulletin has discussed there are several ways Squamish can increase affordable housing supply through design. Land and building material costs can be reduced through zoning that allows for smaller lot sizes, using more compact building forms, building incrementally or using prefabricated housing components. The supply of rental dwelling units can be increased by allowing secondary suites and encouraging housing above retail. And monthly operational costs can be reduced by building energy efficient homes, increasing density to accommodate public transportation, providing space for urban agriculture, and by allowing secondary suites.

6.0 Additional resources

Improving Quality and Affordability
Canadian Mortgage and Housing Corporation
<http://www.cmhc-schl.gc.ca/en/imquaf/>

Affordable Homeownership: Background Discussion Paper
Habitat for Humanity Canada (October 2003)
<http://www.habitat.ca/backgrounddiscussi onpaperenglish.pdf>

Planning Tools to Achieve Affordable Housing
Ministry of Community, Aboriginal and Women's Services
www.mcaaws.gov.bc.ca/housing/planhouse/2004/tools.htm

Affordable Housing Design Advisor
U.S. Department of Housing and Urban Development
<http://www.designadvisor.org/>

BC Housing
<http://www.bchousing.org/>

Grow Homes
University of McGill, School of Architecture, Affordable Housing Program
<http://www.homes.mcgill.ca/index.htm>
<http://upload.mcgill.ca/ott/growhome.pdf>

Energy links

R-2000 Standard
Office of Energy Efficiency, Natural Resource Canada
<http://oee.nrcan.gc.ca/r-2000/english/public/index.cfm>

EnerGuide for Houses
Natural Resources Canada
<http://oee.nrcan.gc.ca/houses-maisons/english/choice.cfm>

Funding Opportunities

Centre for Public Private Partnerships in Housing (CPPPH)
Canadian Mortgage and Housing Corporation
<http://www.cmhc-schl.gc.ca/en/prfias/cacepurpa/index.cfm>

Notes

¹ CMHC (census-based housing indicators and data). NOTE: includes only private non-farm, non-band, non-reserve households with incomes greater than zero and STIRs less than 100%

² District of Squamish Zoning Bylaw No. 1342 (1995)

³ Minimum lot size for Residential Zone 1 (RS-1) as outlined by the District of Squamish Zoning Bylaw No. 1342 (1995)

⁴ CMHC. (1996-2005). *Increasing Density through Lot Size and Design*. Retrieved on February 23, 2005 from <http://www.cmhc-schl.gc.ca/en/imquaf/afho/afadv/cohode/indelsde/index.cfm>

⁵ James Taylor Chair in Landscapes and Liveable Communities. (January 2001). Technical Bulletin 7: A Comparison of Street and Backyard Character of Small Lot Single Family Residential using Front Access Driveways versus Rear Access Lanes. Retrieved on March 1, 2005, from http://www.sustainable-communities.agsci.ubc.ca/bulletins/TB_issue_07_Lot_edit.pdf

⁶ "The average Canadian motorist spent \$9,525.00 or 52.9 cents per kilometre to drive their vehicle in 2002. This national estimate is based on traveling a distance of 18,000 kilometres per year and was calculated by using a Chevrolet Cavalier Z-24 four-door sedan." Canadian Automobile Association. 2003. Retrieved on March 18, 2005, from <http://www.caa.ca/e/news-issues/btw/2003/btw-03-04-03.shtml>

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