

Zoning By-law R4 Zoning Review, Phase Two



Discussion Paper #3: Draft Recommendations November 2019

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R4 Phase 2 Zoning Review: Executive Summary

A liveable city needs affordable housing suited to a range of household types, tenures and incomes. The city's R4 family of zones is intended to permit low-rise apartment buildings, which are an essential part of a healthy and diverse housing mix.

However, the existing R4 rules were established decades ago, and are increasingly misaligned with today's realities of lot fabric, land costs and changing demand. Instead of regulating low-rise apartment development, the current zoning typically prevents or discourages it. This has exacerbated an ongoing and increasingly dire shortage of rental apartments, rising rents and hardship for the one in three Ottawa households who rent their homes.

The R4 Phase 2 Zoning Review will help to improve housing affordability and choice in neighbourhoods in and around downtown by enabling and encouraging the development of small, affordable and context-sensitive infill apartment dwellings within the current R4 zone.

The proposed zoning changes will:

- Revise the lot width and area standards to permit as-of-right low-rise apartment buildings to be developed without the need for lot consolidation or variances;
- Enable buildings of eight to twelve units, within the currently permitted envelope and height limits, on R4 lots that otherwise would have been restricted to three or four units. These changes will tend to produce more affordable and adaptable two- and three-bedroom apartments, instead of the large but expensive units encouraged by the current zoning;
- Introduce basic design standards to the zoning, including requirements for facade articulation and for doors, windows and balconies facing the street. This will help to ensure that new apartment buildings are not anonymous and faceless boxes, but instead integrate with and contribute to the public realm;
- Modify current amenity area requirements to focus on intensive, quality greenspace and trees more appropriate to an urban site and context; and,
- Ensure that surface parking is not permitted to replace, encroach upon or degrade the green spaces, trees, walkways and other functional areas needed to ensure a compatible infill apartment building.

The proposed zoning changes will apply only to lands currently zoned R4, and only within a defined part of the inner urban area (being generally Wards 12 through 17.) Within those lands, substantive changes will apply only to the Three-unit Dwelling, Low-rise Apartment Dwelling and Stacked Dwelling typologies as defined by the Zoning By-law. (Figure 1.)

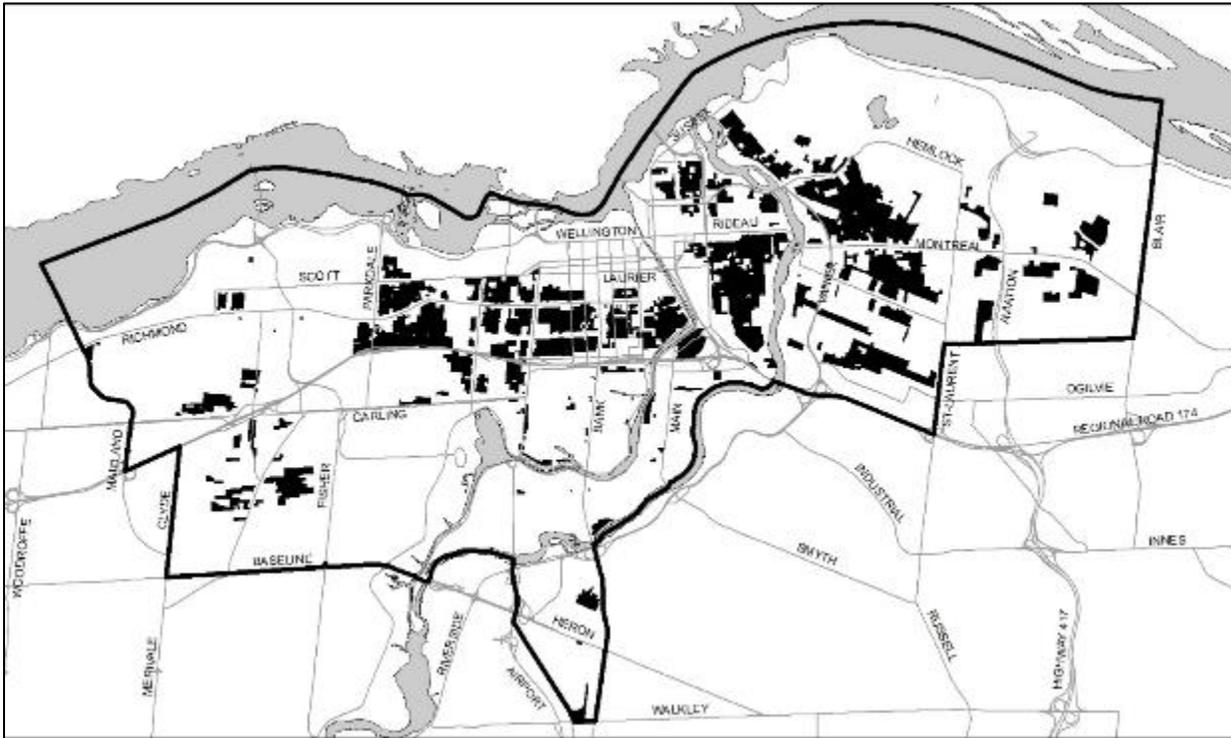


Figure 1: Map of the R4 Phase 2 Study Area

The City is seeking feedback on these proposals no later than January 31, 2020.

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You can keep up with news on this project by checking the project website at Ottawa.ca/R4Zoning.

Introduction

The R4 (Residential Fourth Density) family of zones is the city's most intensive low-rise residential zone, and the only one designed to permit low-rise apartment dwellings. R4 zoning covers much of Ottawa's older low-rise neighbourhoods in the inner urban area, including Centretown, Lowertown, Sandy Hill, Vanier and Hintonburg, as well as parts of Heron Park, Overbrook and Westboro.

Following two Discussion Papers, the first phase of the R4 Review brought a zoning amendment in 2018 that implemented some but not all of the proposals presented in Discussion Paper #2. That amendment closed zoning loopholes that had enabled so-called "bunkhouse" development (i.e. oversized dwelling units with unreasonably high bedroom counts, rented by the room and functioning as *de facto* unlicensed rooming houses in defiance of the intent of the zoning).

The present Discussion Paper #3 relates to the second phase of the R4 Zoning Review. The proposals in this paper would amend the Zoning By-law to encourage more appropriate and compatible low-rise multi-unit housing, particularly in the eight- to twelve-unit range, in the R4 family of zones. Such housing is supported by the Official Plan and would meet an acute need for a "missing middle" range of quality, affordable mid-density urban infill housing suited to a wider range of households, tenures and incomes.

Scope

Unlike R4 Phase 1 which applied city-wide, substantive changes brought through R4 Phase 2 will apply *only* to lands that both

- (a) are currently zoned R4, and
- (b) are located within a specified part of the inner urban area. Figure 1 shows the boundaries of the affected area.

Furthermore, within those areas, the additional requirements and restrictions proposed in this paper will apply *only* to the land uses Three-unit Dwelling, Low-rise Apartment Dwelling and Stacked Dwelling as defined by the City of Ottawa Zoning By-law.

Timeline

We ask stakeholders to provide comment on the proposals in this paper ***no later than January 31, 2020***. A further circulation of final draft zoning proposals is expected in the first quarter of 2020. A report to Planning Committee including a zoning amendment for adoption by Council is scheduled for the second quarter of 2020.

Comments and questions should be directed to the file lead at tim.moerman@ottawa.ca or R4Zoning@ottawa.ca.

Why We're Doing This Study

A liveable city needs a diverse range of housing options to serve a variety of households, budgets, tenures and lifestyles. While Ottawa has reliably produced housing to meet some needs, unfortunately some others have been less well served.

One under-served need is for affordable rental units. One in three Ottawa households rent their homes; the proportion is higher in and around downtown. Several statistics point to a disturbing and worsening trend in rental housing in Ottawa:

- A healthy and balanced rental market should have a vacancy rate of around 3 per cent. From 2010 through 2018, the citywide vacancy rate has averaged 2.4 per cent. In some urban neighbourhoods, vacancies have averaged less than 2% over the same period.
- The scarcity of rental units is driving sharp rent increases, with asking rent on vacant units in the inner urban area rising by 12%-17% a year.

Although much new housing is being built in and around downtown, most of it comes in one of two forms: either infills of two to four large and high-priced units, or else small units in high-rise towers. This limits the options available to the growing number of renters who cannot find appropriate, affordable housing.

For more background on Ottawa's housing challenge, see the [March 2019 Official Plan Housing Discussion Paper](#).

Housing is expensive to build under the best of circumstances. Land costs, development charges and actual construction costs are inherently high, especially in an urban infill context. However, small walk-up apartments in the eight- to twelve-unit range are among the more affordable housing forms for several reasons:

- They can be built on relatively small, existing urban infill lots, generally with units of two or three bedrooms.
- By spreading the cost of an expensive urban lot (typically \$500,000 or more) across more units, each unit can be more affordable to build and therefore to rent.
- Keeping the building to three full storeys or less allows more affordable construction standards under the Ontario Building Code.¹ As well, a building with 13 units or fewer can meet accessibility requirements without an elevator, saving a major capital and operating expense.

Such buildings were once a mainstay of Ottawa's urban housing stock. (Figure 2.) Unfortunately, zoning in place since the 1960's has effectively discouraged such buildings or even prevented them altogether. The result is a "missing middle" in new housing stock that has, over decades, contributed to an ongoing shortage in affordable rental units in inner urban neighbourhoods.

¹ Known as a "Part 9" building, after the section of the Ontario Building Code that governs small buildings. Larger, "Part 3" buildings are subject to a different, more stringent and more expensive set of building standards.



Figure 2: Older walk-up apartment buildings are a familiar feature in urban neighbourhoods such as Vanier, Centretown Sandy Hill, Lowertown and the Golden Triangle. But for decades, zoning and other rules have made this housing form hard to build in Ottawa.

The purpose of this study is to amend the zoning to enable this scale of apartment building to be built in the R4 zone, as affordably as possible, while still ensuring such buildings still meet critical standards including:

- context-sensitive design that allows them to fit in well with their existing neighbours;
- appropriate storage and management of garbage and recyclables;
- trees and quality urban greenspace; and
- compliance with the Ontario Building Code and accessibility standards.

For more information, see our Frequently Asked Questions document at Ottawa.ca/R4Zoning.

Zoning Recommendations

1) *Establish three urban R4 subzones, with unit density tied to lot sizes.*

Inner-urban Ottawa currently has fourteen different R4 subzones, each with slightly different rules which were generally inherited from older by-laws. Most of the distinctions are either trivial² and/or have been superseded by recent amendments brought through Infill 1³ and/or Infill 2. The only material difference between these zones boils down to how many units an apartment building is allowed to have, and how big the lot has to be:

² In most cases, the differences have nothing to do with apartments at all, but establish different minimum lot sizes for lower-density forms such as townhouses and detached houses.

³ Notably the front yard requirement of either 3m or 6m, which is now established by reference to neighbouring buildings' yards.

The "Junior" R4 zones (R4A through R4L) generally allow low-rise apartment dwellings on 12m (40') wide lots⁴, but cap such buildings at four units; and

The "Senior" R4 zones (R4M through R4ZZ) have no explicit limit on the number of units, but allow them only on larger lots, generally with a minimum lot width of 15m (50').⁵

We propose to replace the existing fourteen subzones with three urban R4 subzones, with unit counts tied more appropriately to lot sizes. ***The net effect in each of these cases is to allow buildings of eight or twelve units on R4 lots and within building envelopes that are currently restricted to four units.***

Schedule A (accessible from Ottawa.ca/R4Zoning) shows where existing Junior and Senior R4's will be replaced with one of the three urban R4 subzones.⁶

Existing exceptions, suffixes and schedules would remain in place under the new urban R4 subzones.

1a) R4-8U Zone

The R4-8U zone would generally replace existing Junior R4's in the inner urban area but further from downtown and from rapid-transit stations. It would allow 11m high buildings with up to 8 units, on lots that are 10m wide or greater.

1b) R4-12U Zone

The R4-12U zone would generally replace existing Junior R4's close to downtown and/or near rapid-transit stations. R4-12U would permit:

- On lots 10m wide or greater, 11m high buildings with up to 8 units;
- On lots 15m wide or greater, 11m high buildings with up to 12 units.

1c) R4-UU Zone

The R4-UU zone would generally replace the existing R4S, R4T, R4V and other Senior R4 zones. It would maintain the current permissions for lowrise apartments with no explicit limit on number of units on large (15m+) lots. However, it would also allow small apartment buildings on smaller lots than are currently allowed:

- On lots 15m wide or greater, 14.5m high (four-storey) buildings and no limit on unit counts. This is what is currently permitted in R4S and R4T;
- On lots 10m wide or greater, 11m high (three-storey) buildings with up to 8 units; and
- On lots 8m wide or greater, 11m high buildings with up to 5 units.

1d) Harmonize lot size and yard standards for Three-unit Dwellings and Low-rise Apartment Dwellings in all three urban R4 zones.

⁴ The R4B and R4E zones, which cover most of Vanier, are exceptions in that they require minimum lot sizes of 15m or 18m wide.

⁵ The R4M and R4N zones require 18m (60').

⁶ These subzone names are working titles for the purposes of this Discussion Paper.

Current R4 zoning typically applies different, less-stringent standards to a three-unit dwelling than to an apartment dwelling. This mismatch has encouraged some developers to build triplexes and then immediately apply for variances to allow them to convert the building to four or more units.

To definitively close the door on this abuse of the variance process, the three new urban R4 zones will apply the same lot size and yard requirements to three-unit dwellings as it will to buildings of four or more units.

2) *Landscaping and amenity area requirements*

Current zoning requires low-rise apartments to provide 15m² of "amenity area" per unit for the first eight units, in the rear yard, of which 80% must be soft landscaping (e.g. grass.) The result is that an eight-unit urban apartment building is essentially required to provide about a thousand square feet of lawn in the rear yard alone.

The amenity area requirements were introduced in 2015 to indirectly prevent rear yards from automatically being paved for parking. However, the main effects have usually been to hold urban, small-lot development to a suburban, large-lot standard, and to block the production of affordable rental housing in the name of providing a watered-down version of a suburban back yard. (Figure 3.)

- The 15m²/unit requirement is imposed without regard for the size of the lot; in many cases, it would occupy more than the total area of the required rear yard. On smaller lots, it cannot be met at all.
- The per-unit standard encourages construction of fewer but larger units (because fewer units means less amenity area requirement.) These in turn are ill-suited to many households who do not need or cannot afford a 1,500 square foot urban apartment.
- The current amenity area requirement leaves no space in the rear yard for exits, stairways, walkways and other functional spaces that make an urban apartment building workable.
- Treating amenity areas as a fixed quantity in the back yard takes no account of the quality or function of these spaces in an urban context, how they relate to the building's occupants, and how they connect the building to the neighbours or the public realm. It requires (and accepts) a large, unprogrammed grass area when a smaller, more intensively-planted area with a mix of hard landscaping and trees and shrubs is more appropriate.

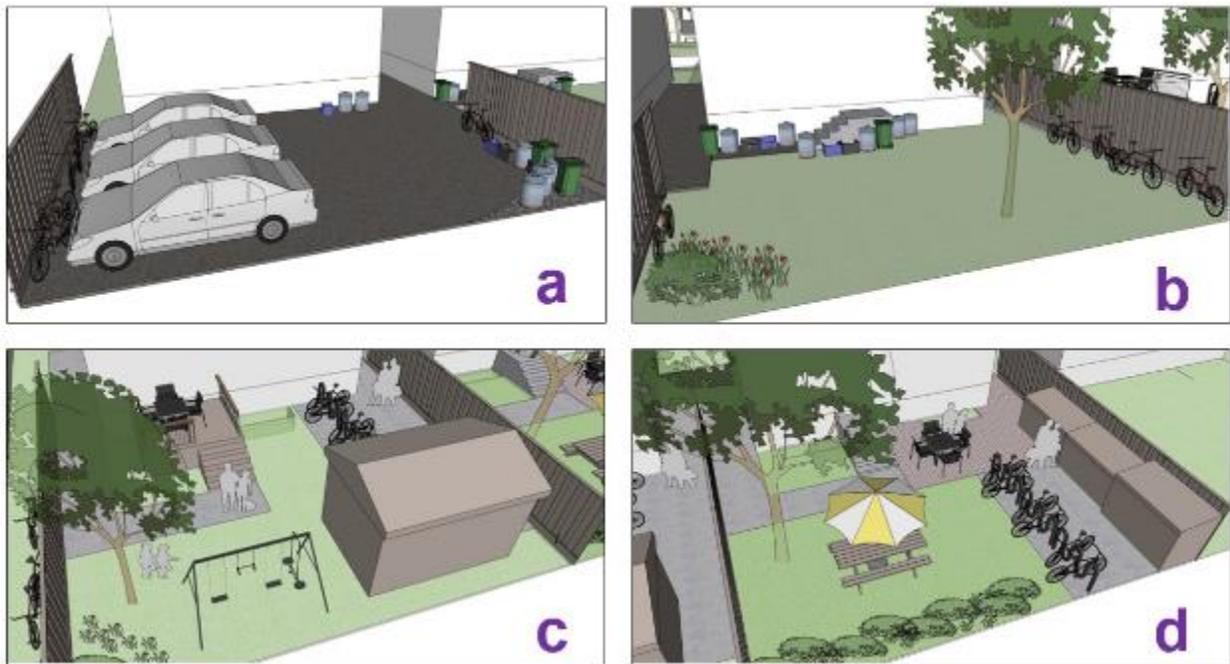


Figure 3: (a) Prior to 2014, rear yards could be completely paved, usually for parking. This left no space for bicycles, proper storage of waste and recyclables, or trees. (b) A rear yard under amenity area requirements since 2014. These rules require extensive amounts of soft landscaping (e.g. grass) but still leaves no room for functional areas in the rear yard, and leads to an unprogrammed space with little connection or use to the residents. (c) and (d) Under the proposed rules, smaller blocks of intensive landscaping and could be integrated alongside well-designed bicycle parking, pedestrian circulation and other features of a workable urban apartment building.

The proposed zoning would replace the current framework with a more targeted and deliberate approach to greenspace and amenity area:

2a) Any part of the lot not occupied by the main building, accessory buildings or structures, permitted projections, walkways, bicycle parking or waste storage and management areas, must be landscaped with soft landscaping.

Maximum as well as minimum limits would apply to such hardscaped areas and outbuildings, to prevent someone from claiming the entire rear yard as e.g. one big walkway.

2b) The landscaping required by 2a), in any yard, must be grouped into at least one contiguous area large enough to support a tree or shrubs, to be established through the Site Plan Control process.

2c) At least one balcony per storey above ground level is required on the street facade, and each such balcony must be at least 3m² in area.

Balconies enhance the connection between the public street and the private realm, and avoid the anonymous, inward-looking impression that a less sensitive apartment design might present.

3) **Building and Site Design**

One of the most common concerns raised about infill development is the tendency to produce simple, boxy structures. At the extreme, some infill buildings have presented minimal windows, no entrances and featureless, anonymous facades to the street.

- Current zoning has no standard requirement for an entrance to face the street,⁷ nor for a minimum amount of windows facing the street.
- Similarly, the current zoning establishes no requirement for any variation in the front facade. On small buildings this is not a serious problem, but for wider, taller buildings, it effectively permits an overly "boxy" form that fits poorly in its context.
- Rules around bay windows prevent them from reaching the building foundation, effectively discouraging an attractive design feature that would further mitigate the "box effect."

These basic elements of building design and character are currently addressed through the Site Plan Control process instead. However, the Planning Act does allow zoning to regulate character of buildings. And while zoning should not be used to micromanage design, basic standards of design sensitivity should be enshrined in the Zoning By-law. The proposed zoning would require:

3a) At least one active entrance is required on the front facade.

An "active entrance" is a defined term in the Zoning By-law; it simply means an entrance that is clearly intended as the principal entrance to a dwelling unit or to the building. Fire exits and loading doors don't count, but a door serving as the principal entrance to a ground-floor unit does.

3b) A minimum fenestration ratio of 25% is required on any facade facing the public street.

By requiring at least 25% of the street facade to be composed of windows (including glass components of doors), this will help ensure that the building presents an adequate face to the street.

3c) Bottom window sills of windows facing the public street must be located no higher than 75cm (2 ½') above floor level.

A high window sill has the effect of disconnecting the interior of the building from the public realm, and thereby reinforcing the anonymity and disconnection of the residents from the community. (To pick an extreme example, consider the difference between the living room window in a suburban house, which connects the residents to the outside world, versus the bathroom window in the same house which is obviously designed for the opposite effect).

⁷ Although, within the Mature Neighbourhoods Overlay, the Streetscape Character Analysis may require a street-facing entrance if and only if most other buildings on the street have one.

Since some builders will seek to minimize costs by providing the smallest windows allowed by the Building Code, zoning can and should ensure that front-facing windows serve to connect rather than isolate.

3d) At least 20% of the front facade must be recessed an additional 1.5m from the front yard setback line.

This requirement will ensure that some variation in the street facade will be achieved. This variation can be achieved any number of ways, such as setting back a vertical slice of the front facade as shown in Figure 4, right image; however, it could also be met by stepping back an upper storey, by recessing the front entrance, or some combination of these.

3e) Bay windows may project up to 50cm into a required front yard and, within such yard, may occupy a footprint not exceeding two square metres.

Allowing bay windows to project slightly into the front yard, and allowing them to provide some additional floor area to the inside of the unit, offsets some of the indoor floor space lost to the additional setbacks required by 3d) while creating an incentive to add articulation to the building facade.

Figures 4 and 5 illustrate the effect that these standards would have on the potential building envelope and facade permitted under the zoning.

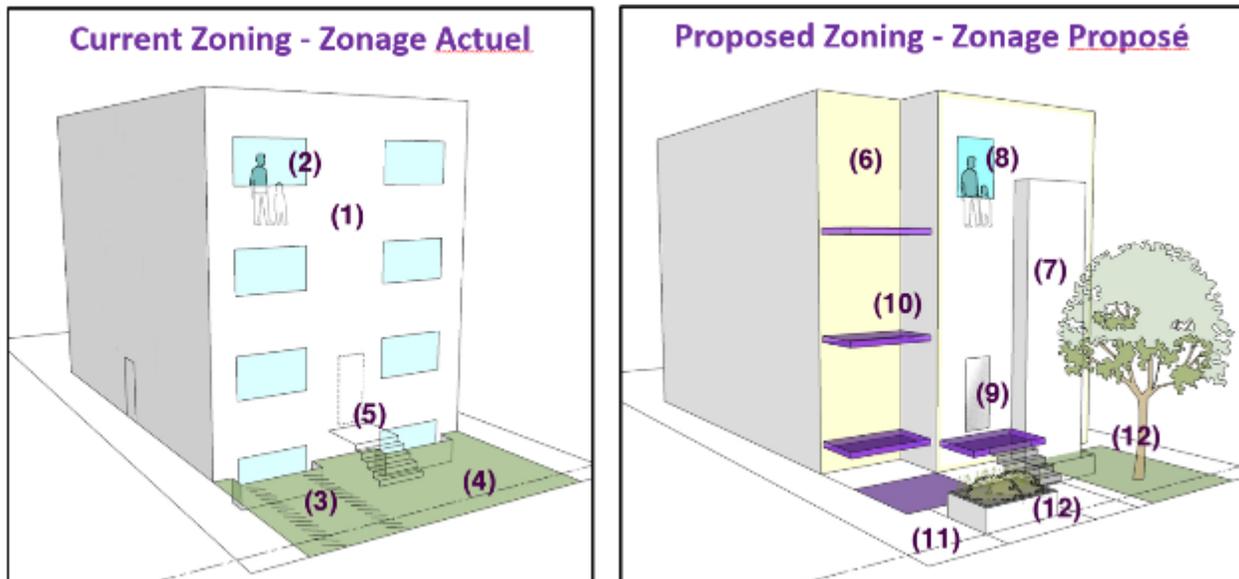


Figure 4 LEFT IMAGE: The current zoning envelope (left image) allows a flat-faced, anonymous box design that cuts off the building and its occupants from the public realm. (1) Current zoning allows a flat facade and tends to provide little incentive for front yard projections that would break up that flatness. (2) With no minimum requirement for windows facing the street, often with high window sills, the building is further cut off from the public realm. (Think of how the big window in your living room connects your house to the street, and contrast that how the small, high window in your bathroom is (rightly!) designed to do the opposite.) (3) Front yards are meant to be green space; but with just grass, they are disconnected from the residents and become informal, illegal parking spaces after the building is built. (4) As well, with no dedicated space for placing garbage on collection day, trash is often piled on the front lawn. (5) Current zoning usually does not even require an entrance on the front facade (although this is usually secured through Site Plan Control.)

Figure 4 RIGHT IMAGE: Zoning could (6) require part of the front wall to be set back somewhat deeper from the front setback line and (7) encourage projections such as bay windows for a more articulated facade. (8) A minimum fenestration ratio on the street-facing facade, including window sills no more than 75cm above the floor level, would ensure better connection with the front yard and the street. (9) Zoning should require at least one principal entrance to at least one unit on the front facade, and (10) requiring balconies on the upper floors creates both amenity space for the residents and a better connection with the public realm. Finally, requiring (11) a small dedicated pad for garbage-day collection (big enough to hold the trash, but not big enough to park on!) as well as (12) trees, planters and other features would serve as "parking excluders" and ensure that the front yard greenspace does not become "pirate parking."



Figure 5: With the proposed design standards built into the Zoning By-law, new buildings would be much more sensitively designed with their surroundings.

4) **Parking**

Buildings of up to 12 dwelling units are already exempt from minimum parking requirements throughout the study area. This was done in 2016 in part to enable and encourage car-free households to find housing downtown, near rapid-transit stations and mainstreets, and as a first step to enable more affordable housing.

However, it was also a recognition that apartments on small lots are not compatible with surface parking. The space requirements for garbage management, bicycle storage, Building Code-mandated exits and accessibility ramps, and trees and greenspace simply leave no room for even a single parking space. (Figure 6.)

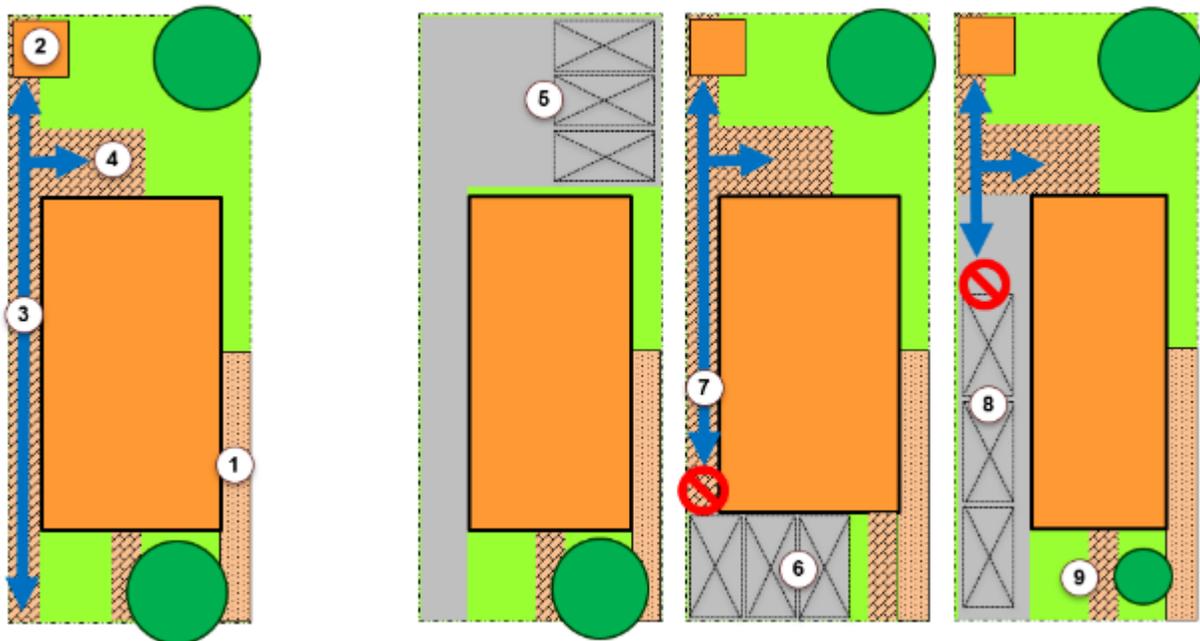


Figure 6: Low-rise apartments have Building Code requirements for wheelchair ramps (1). They also require space to be devoted to garbage storage (2) and a path to move waste to and from the curb (3). Hard landscaping and bicycle parking are also appropriate (4,) and trees are desirable as well. However, attempting to fit parking on the lot interferes with all of these. Putting parking in the rear yard leaves no room for trees or functional areas (5). Putting it in front creates a big curb cut, leaving little or no room for trees in front (6) and the parked cars still block the side yard (7). Parking in tandem in the side yard also blocks front-to-back circulation (8) and takes up more frontage, squeezing front-yard tree space (9.)

Several residents' groups have expressed qualified support for enabling small apartment dwellings on small lots. However, they are also concerned that all the desirable and necessary features that enable an apartment building to fit well as infill, such as trees, greenspace and waste management, may end up being sacrificed to the builder's desire to fit parking onto the lot.

4a) In the case of a low-rise apartment dwelling or stacked dwelling on a lot of less than 15m in width or of 450m² in area:

- i) no surface parking spaces are permitted, other than bicycle parking spaces; and;
- ii) any part of the front yard larger than 2.6m x 5.2m must be planted with shrubs, trees, or raised planters, and/or equipped with fences, bollards, outdoor furniture and/or other physical barriers sufficient to prevent such spaces from being parked on.



Figure 7: Experience has shown that even if parking is not required, some buildings will end up with cars parked illegally on what should be green space. Physical barriers, required through zoning, can help prevent this.

5) Miscellaneous topics

5a) Side yards for the rear part of apartment buildings

Current zoning requires an increased side yard (6m rather than 1.5m) for that part of an apartment building that is 21m or more from the front lot line. This decades-old rule was aimed at large apartment buildings on very wide lots. It is not appropriate for smaller buildings, and its intent has been effectively superseded by the increased rear yards introduced through Infill Phase 2. We propose to delete that rule.

5b) Remove the 30% landscaping requirement for small low-rise apartment dwellings on small lots

Current zoning requires that 30% of a lot containing a low-rise apartment dwelling be landscaped. This figure was originally intended to ensure that builders did not simply pave a large lot, and small apartment lots (four-unit buildings) in the junior R4 zones were effectively exempt from this limit, in recognition of the limited space available on such lots.

The prohibition on surface parking noted in 4), and the revised amenity and landscaping requirements in 3), serve these purposes adequately. It is therefore proposed to exempt buildings of 12 or fewer units and on lots of 450m² or less from this requirement. Larger buildings and lots will continue to have to landscape 30% of the lot.

5c) Permit any Building Code-mandated exit stairs as projections into the rear yard.

Of the various designs produced for infill lots, one found particular appeal with the Technical Review Committee. This design provides eight generous two-bedroom units in a configuration that puts the main entrance to the entire building on the front. However, meeting the Building Code for this design requires an exit staircase to project 2.2m into the rear yard.

Clarifying that such stairs, to the extent required by the Building Code, may be located in a required rear yard will enable this practical and well-received design to be built.

5x) Regulation of air-conditioning units through Site Plan Control

Both phases of the R4 zoning study have drawn comments about the number and location of air conditioning units on new multi-unit buildings.

After due consideration of the subject, we do not propose to regulate such units through the Zoning By-law; the more reliable mechanism in this instance is the Site Plan Control process.

5x) Waste Management through Site Plan Control

R4 Phase 1 brought in requirements for indoor garbage storage (within main or accessory building) for buildings up to 6 units. This was done to ensure that the multiple garbage cans, recycling bins etc. associated with this scale of building would be properly contained.

At 7+ units, however, both Site Plan Control and the City's Waste Management By-law apply. At this scale of building, the City no longer supports curbside collection of individual garbage cans and begins to require containerized collection (i.e. dumpsters and large rolling bins for recyclables.) For this reason, we believe no zoning requirement for garbage storage is needed, and Site Plan Control is adequate to determine the location and manner of waste storage.

The zoning will, however, clarify that projections into side yards must not interfere with a minimum path of travel for waste containers.

5x) Prohibit rooftop terraces in Sandy Hill

Sandy Hill residents have identified rooftop patios as a source of unreasonable nuisance specific to their area. The proposed zoning would prohibit rooftop patios on low-rise apartment dwellings, triplexes and stacked dwellings within Sandy Hill.

Share your thoughts and ideas

We encourage you to send us your thoughts, questions and comments on the R4 Zoning Review after reading this paper. Please send feedback no later than **January 31, 2020** to:

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You can keep up with news on this project by checking the project website at Ottawa.ca/R4Zoning.

Appendix A: Technical Review Committee

As part of this study, we engaged an architect to design sample buildings that would be enabled under the proposed zoning changes. The central question was, can a workable apartment building be designed to fit on a typical, small infill lot? The consultant, Rosaline J. Hill Architect (RJH) was asked to produce building schematics, site plans and floor plans subject to the following parameters:

- Eight to twelve dwelling units, seeking wherever possible to provide two- or three-bedroom units;
- Ensure compliance with the Ontario Building Code, including accessibility standards;
- Building height to be no higher than 11m (three full storeys plus a basement;)
- Yard and setback requirements established by current zoning, including a 1.5m minimum side yard as currently required for low-rise apartments;
- Provide for storage of waste and recyclables consistent with City standards under the Waste Management By-law 2012-370.
- Provide enough space for eight functional bicycle parking spaces (more than is required by current zoning); and
- Subject to the above, provide as much usable, contiguous greenspace in the rear yard as possible, including space for trees. Front yard space is to be entirely devoted to greenspace except for pedestrian walkways, accessibility features and paths for moving waste to the curb.

Designs were produced for notional rectangular lots of 100' deep (the typical block depth in Ottawa, equal to 30.48m) and three lot widths (10m, 12m, and 14m.) These lots sizes are considered representative of much of the existing lot fabric in the inner urban area.

Later in the project, the scope was expanded to include basic design standards for street-facing facades, and to model a five-unit building on an 8m x 100' lot.

The exercise recognized from the outset that large units in an infill context are inherently expensive, and that floor area per se is less important than affordability and the ability to provide Code-compliant units. The resulting units were therefore compact. In some cases the consultant was asked to design floor plans for compact units to demonstrate whether Code-compliant two- or three-bedroom units could be achieved.

Designs were presented and evaluated at two meetings in July and October 2019 by a small technical working group comprising architects, planners, developers, community association representatives, community workers and Building Code experts.

10m wide lots

The modelling exercise found two different configurations for an eight-unit building on a 10m wide lot, with viable units of one to two bedrooms. These designs, after devoting space to bicycles and waste management, also left enough space in the rear yard for 25-40m² of green space, enough for one or more mature trees.

12m wide lots

The modelling exercise found three viable ways to put eight units of two to three bedrooms each on a 12m wide lot, with 38-57 square metres (410-610 square feet) of green space in the rear yard. (A fourth model was deemed financially unfeasible due to an inefficient interior layout i.e. too much space devoted to stairwells and corridors.)

Two of these models place the main entrance to the common stairwells on the front of the buildings. One of these models⁸ was particularly attractive; in addition to being highly efficient in internal layout, it also allows for the ground-floor unit to be reconfigured into a three- and a one-bedroom, or a single large four-bedroom unit, making it a particularly adaptable option. It also provides for an unobstructed and level side yard, allowing maximum flexibility for dealing with waste and recyclables. However, this model also requires Building Code-mandated exit stairs to project into the rear yard, which is not currently permitted by zoning.

14m wide lots

At fourteen metres, several configurations allowed eight, ten or twelve units to be established, with a mix of one-, two- and three-bedroom units and between 50 and 90 square metres (540-970 square feet) of rear-yard greenspace.

At fourteen metres, two configurations of eight-unit stacked dwellings also became possible. Because of differing Building Code standards than for apartment buildings, these models provided for more efficient building layouts and allowed for eight units of about 900 square feet each.

8m wide lots

After the initial models were presented, the consultant was asked to produce a design for a five- or six-unit building on an 8m wide lot. A five-unit building is viable on this lot comprising two bachelor or one-bedroom units and three three-bedroom units.

Garbage management

The critical criterion for these designs was to ensure that waste and recycling could be managed responsibly. Depending on the building and site design, up to three ways of storing and managing waste and recyclables were available:

In buildings where both side yards were occupied by either stairs or wheelchair ramps, two strategies were possible:

- 1) Garbage would be stored in a narrow wheeled front end loader container (skinny dumpster) in a small garbage nook with a rollup door at the front of one side yard. This would meet existing City standards and allow the dumpster to be moved to the curb on collection day for collection by the City. Recyclables and organics in 240-360L wheeled

⁸ This model was then used as the “reference unit” for the purposes of modelling costs and minimum viable rents: see Financial Analysis below.

containers could then be located in outbuildings or sheds in the rear yard and moved to the front yard via the wheelchair ramp in one side yard.

- 2) Garbage could be stored in 360L wheeled containers in a rear-yard shed. This would not meet current City of Ottawa standards, which require a dumpster; however, private collection could be required through the Site Plan agreement.
- 3) In designs where one or both side yards is level and unobstructed, waste could also be stored in a rear-yard outbuilding, with a Site Plan agreement requiring the building manager to bring waste to the curb for public pickup.

Planning will in any case be bringing input to an upcoming review of the Waste Management By-law, to ensure that waste management and planning concerns are aligned.

Financial Analysis

The present rental housing affordability crisis has many causes, but most notably a scarcity of housing that has detached rents from the actual cost of production. As a result, buildings that were built decades ago and that could be rented affordably (and were, as recently as a few years ago,) now rent for much more, simply because forces of supply and demand have driven up the asking rents.

More housing supply is needed to even begin to offset this scarcity-driven pricing. Amending the R4 zoning to enable more units to be built is a necessary prerequisite to restoring affordability.

At the same time, the cost of developing housing necessarily puts a hard floor on how *little* that unit could be rented for, and still turn a profit. The more it costs to build a unit, the higher the minimum viable rent will have to be (or else the return isn't enough to justify building it.) So, while creating more supply is itself critical to bringing rents back in line, it is also important to avoid making those new units any more expensive than necessary.

The designs produced for the modelling exercise were evaluated by a financial consultant, Renfroe Land Management (RLM), to estimate the development costs and the minimum amount the resulting units could rent for while still keeping the project financially viable.

To estimate costs, RLM used the eight-unit building design preferred by the Technical Review Committee working group participants. The reference unit in that building design, a 714-square-foot two-bedroom unit, built as low-rise, wood-frame, Part 9 buildings, could ultimately rent for as little as \$1677 a month. (Figure 8.)



Figure 8: Building illustration and floor plans for one configuration of eight, two-bedroom units on a 12m wide lot.

RLM also estimated the incremental cost of certain design features, variations and procedures, and the resulting effect on the minimum viable unit rent on that reference unit:

Avoid Site Plan Control: subtract \$107/month.

The Site Plan Control process required by the City has been identified as a major cost in apartment production, both in direct costs (application fees and various reports and plans) as well as carrying costs (interest paid on loans while waiting for the development to be approved.) RLM estimates that Site Plan Control accounts for roughly \$170,000 to the cost of developing a small apartment building, and accounts for **\$107/month** worth of monthly rent. Without Site Plan Control, the resulting savings mean the reference unit could rent for as little as \$1570/month.

Remove one storey and two units: add \$485/month.

RLM modelled the reference building with one storey removed, that is, six units across two storeys and a habitable basement (rather than eight units on three and a half storeys.) Because land costs are fixed and spread across fewer units, the resulting units would have to rent for at least **\$2162/month**, or almost 22% more than in an eight-unit building.

High-rise instead of low-rise construction: add \$243/month

That same 714-square-foot two-bedroom unit, in concrete construction (i.e. in a high-rise building) rather than wood-frame, adds \$243/month to the minimum viable rent. That unit would have to rent for **\$1920/month** due to the higher hard costs of concrete construction.

Indoor Garbage Storage: add \$61/month.

Requiring all waste and recyclables to be stored inside the main building, rather than in accessory buildings or sheds in the rear yard, removes 20 square meters (220 sq.Ft.) from the leasable floor area of the building. To make up for the lost leasable area that nonetheless must be built and paid for, the average rent on units increases by an estimated \$61/month.

Other design features

Other features modelled in the modelling exercise were evaluated for their effect on minimum viable rent as follows:

- Add recessed balconies on street-facing units: **add \$21/month/unit.**
- Add 2 ½ storey bay window: **add \$10/month/unit.**
- Enclose the rear exit stairs (currently proposed as permitted projection into rear yard): **add \$5/month/unit.**
- Locate air-conditioning units on the roof instead of on side of building: **add \$5/month/unit.**
- Increase front facade fenestration ratio to 25% or more: **add \$3/month/unit.**

These estimates serve to illustrate the overarching point: while every standard, procedure or add-on adds to the cost of a building, they do not do so equally. The added costs vary by orders of magnitude.

The greatest costs illustrate how very low density infill and very high density development work against affordability, each for different reasons. By far the greatest per-unit cost increase comes from limiting the number of units, as the cost of the lot (typically in excess of half a million dollars) must be borne by fewer units. Conversely, directing development to high-rise areas similarly adds hundreds of dollars to the end tenants' rent.⁹

Meanwhile, building features that might be considered desirable can be assessed in terms of their effect on what the tenant must pay. Indoor garbage storage adds significantly to the minimum rent, while design features that make the building relate better to the public realm are comparatively cheap.

Finally, Site Plan Control imposes a significant cost on new units. Some consideration should be given to streamlining the Site Plan Control process for smaller buildings, or even in some cases eliminating the requirement altogether.

⁹ RLM also modelled building a block of three townhouses. However, while the 12m wide lots that could accommodate eight apartments are fairly common, infill lots large enough to hold a block of townhouses are so rare as to be essentially nonexistent. Building three townhouses therefore requires accommodating two lots and consolidating them, adding an extra \$515,000 in land costs to the project. The resulting townhouses would have to rent for over \$5000 a month each to be viable. This is an extreme illustration of how limiting unit counts on urban lots works against affordability.