


I N F I L L H O U S I N G

Increasing Residential Density and Assessing Design in Context in Winnipeg, Manitoba



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Background

This capstone explores infill housing qualities and effects it has had on communities in four inner-city neighbourhoods. It examines infill constructed since 2012 before the introduction of infill design guidelines. Assessing infill developments takes into account how these buildings have reshaped or maintained context urban character and social identity. It also assessed whether these developments align with the *Complete Communities* goals for *mature communities*. Archival and walking surveys, an observation index, and GIS mapping were used to collect data needed to complete this evaluation.

Infill housing: an approach to Smart Growth

Infill housing reflects the smart growth vision that encourages densifying established communities and curbing urban sprawl to protect natural resources, such as farmlands and wooded areas.¹⁻²⁻³⁻⁴⁻⁵⁻⁶⁻⁷

Infill supports: transit service and mixed-use planning

Infill housing requires an adequate level of services, like transit, infrastructure, commercial services, and other amenities, to support both existing and added residential densities.¹⁻⁷

Seeking social inclusion through infill housing

Planning infill housing should respond to community needs by creating various housing forms, incorporating aspects like affordable housing, intergenerational living, and accessible units.⁵⁻⁷

Regulatory barriers to infill housing

Among many barriers restricting infill housing, the regulatory barriers increase the complexity of completing development applications due to the need to vary zoning by-laws and rezone properties, for example. Residents' opposition to these applications can make it even harder to overcome these barriers.²⁻⁸

Designing in context: building design and public realm design

Various aspects of building and site design can help infill developments integrate with context while adding value to the urban form, creating a positive pedestrian experience, and developing social interaction opportunities in the public realm.⁹

GAPS

Limited research has addressed infill housing at the micro-urban and architectural levels.¹⁻²⁻⁷⁻⁹⁻¹⁰⁻¹¹⁻¹²⁻¹³

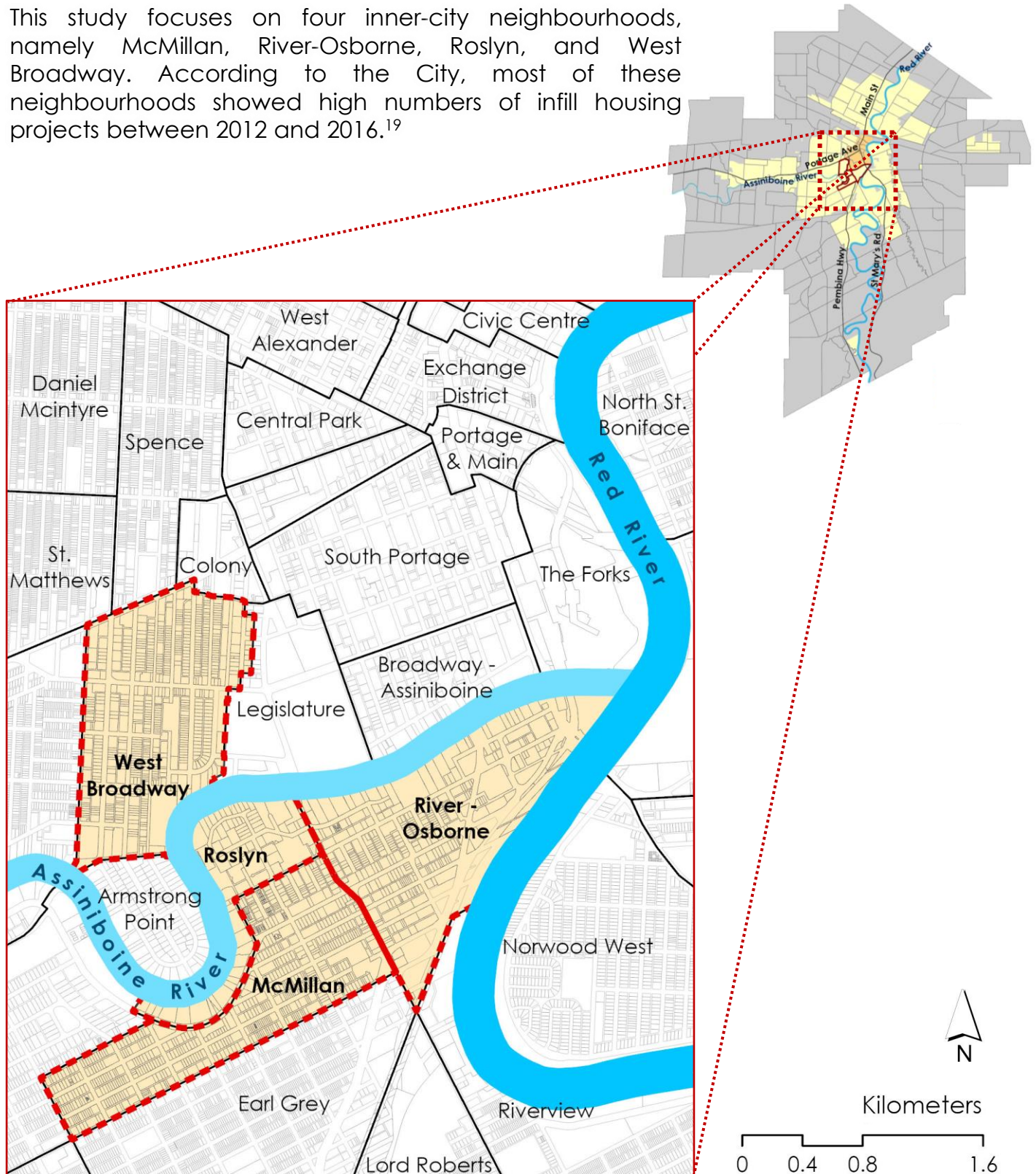
Grey literature, including professional institutions and municipal regulatory manuals, has unevenly interpreted and communicated infill housing goals, application and processes to the public.¹⁴⁻¹⁵⁻¹⁶

This research attempts to explore the dimensions of these topics and their application in the Winnipeg context. It also examines the consequences of creating infill housing in the absence of specific guidelines, policies, and regulations to oversee and monitor the establishment of infill housing development in the Winnipeg *mature communities*.

Context

During the last five decades, **Winnipeg's footprint doubled while its overall population increased by 37% only, but the population in mature communities steadily dropped.**¹⁷ Thus, the City plans to house 200,000 more people by 2040 in the established communities.¹⁸

This study focuses on four inner-city neighbourhoods, namely McMillan, River-Osborne, Roslyn, and West Broadway. According to the City, most of these neighbourhoods showed high numbers of infill housing projects between 2012 and 2016.¹⁹



Research Questions & Methods

How has infill housing been developed in Winnipeg's inner-city neighbourhoods since 2012?

Where did these developments take place?

What were the previous site conditions before establishing the developments?

What are the land uses of these developments?

What types of variances did the developers request? What variances were approved by the City? What variances failed?

What effects have these developments had on the public realm?

Do they integrate or stand out in their surroundings?

How do they contribute to the quality of public spaces?

How do they align with the *Complete Communities* goals for *mature communities*?

Archival Survey

A comparison between recent and older maps and street views helped locate infill housing and find the previous use of the sites. A review of the City's property assessment database allowed recording the present use of infill housing projects and the zoning of other surveyed sites. Scanning the City's archives also revealed variance applications associated with infill housing and the requests embedded in these applications. Reviewing the City's documented infill Q&A webinars conducted in October and November 2020 uncovered participants' concerns.

Walking Survey

Surveying the study areas in the first week of November 2020 allowed locating the most recent infill housing sites that were undetected using the archival survey. This method also enabled collecting photos of all surveyed sites to be used in the observation index.

Geographic Information System (GIS) Mapping

GIS mapping was used as a spatial analysis tool and to facilitate collecting data by other methods. It helped define the walking distance and context boundary of each development assessed by the observation index.

Infill Housing Observation Index

This method helped evaluate infill housing developments based on the following five criteria developed according to the literature and the City's infill housing guidelines and *Complete Communities*.

- Character, form, and diversity
- Scale and massing
- Siting
- Interactive outdoor spaces
- Densification

A unified weighing scale was developed to help compare the results of these criteria. Assessing the developments was relative to their context, extending 60m both ways from property boundaries while the neighbouring buildings directly adjacent to any infill site represent the immediate context.

LIMITATIONS

The assessment data of a few infill housing developments was outdated.

There was no data about Q&A webinar participants.

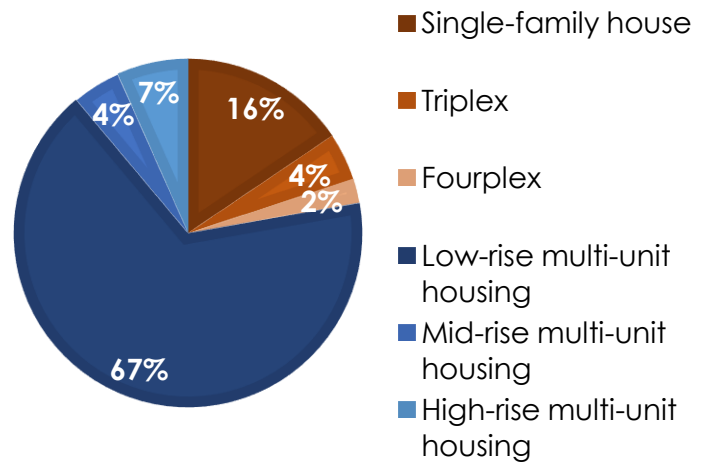
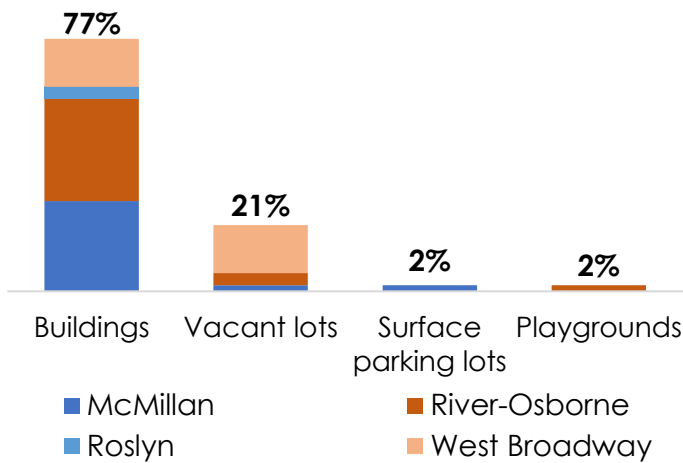
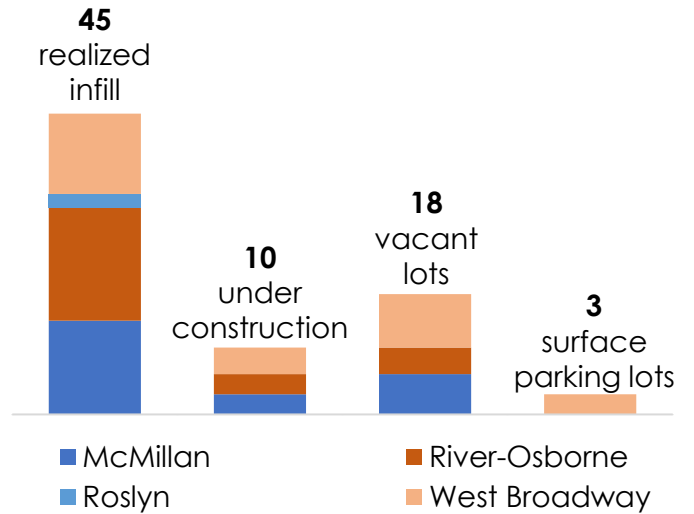
Unifying the observation index's weighing scale does not necessarily indicate that these criteria are equally important.

This study did not consult professional planners or other stakeholders.

Findings

Survey results of 76 surveyed buildings

Surveying the four neighbourhoods uncovered 76 sites relative to the study, of which 55 infill housing sites were mainly concentrated in River-Osborne, McMillan, and West Broadway, respectively. Vacant lots identified in the survey accounted for 24% of the total surveyed sites. The area of surface parking lots located in West Broadway accounted for 26% of the total area of identified infill housing sites in the same neighbourhood.



Previous site conditions of 55 identified infill housing developments

Most infill housing developments, both realized and under construction, replaced existing buildings.

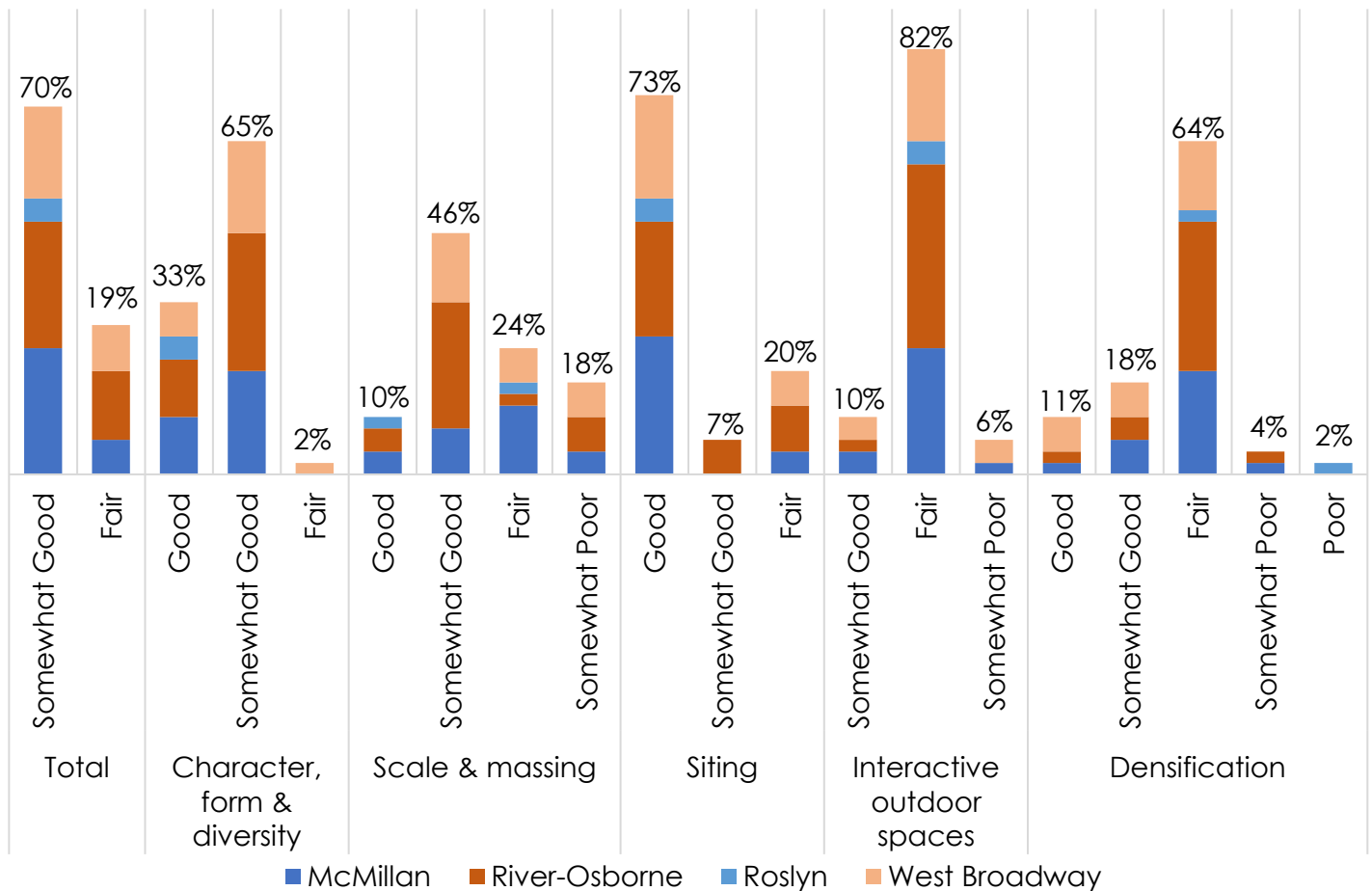
Land use of 45 realized infill housing developments

Low-rise multi-unit infill housing dominated the inventory of infill developments, followed by single-family houses.

The review of variance applications indicated that **45% of infill projects underwent variance applications, of which 93% of the requests embedded in these applications were approved.** Most developers requested up-zoning the properties, changing parking requirements, reducing setbacks, and reducing parking spaces.

The Q&A webinar scan found that stakeholders' concerns of infill housing were mainly related to the buildings created as infill housing and the processes surrounding infill housing development.

Findings



Evaluating the realized infill projects using the observation index indicated that **the quality of most infill housing was somewhat good**. Most buildings well responded to the *Siting* and *Character, form and diversity* criteria. Their performance reduced as they passed the *Scale and massing* and *Densification* criteria, while the *Interactive outdoor spaces* scale ranked the least for most developments. The results of the observation index tool also showed the following:

- 94%** of infill increased site density
- 20%** of infill increased context density
- 93%** of infill was in surroundings having at least 3 architectural styles
- 80%** of infill adhered to immediate context front setbacks
- 68%** of infill adhered to immediate context building heights
- 49%** of infill introduced new roof form to the immediate context

- Less than 40%** of infill well integrated with and diversified the context using building features and details
- 89%** of infill created interactive outdoor spaces
- 78%** of infill created green areas and fenceless sites
- 8%** of infill created sitting areas
- 4%** of infill created outdoor communal spaces

Discussion

Replacing existing housing stock questions the quality of previous buildings and whether it was more sustainable to keep them and create infill in vacant lots.

Increasing the density of infill sites without altering that of the context implies that *mature communities* have not yet achieved density saturation levels.

A change in the ratios of housing forms between existing housing stock and infill housing may change the social identity of the context.

Self-centric design decisions may succeed in creating a fitting building in a context that improves the sense of pride in the community. Still, it is not enough to create a well socially interactive public realm.

Although site location is critical for developing infill housing, ensuring access to transit and adequate services is a collective responsibility.

Recommendations

Updating zoning by-laws and zoning designations can reduce the regulatory barriers and help control how infill housing changes the urban form and housing composition.

Removing parking minimums and developing a parking strategy and parking assessment tool can help infill housing respond to the community's commuting patterns without compromising the supply of parking spaces.

More public engagement can help educate the community about the value of infill housing and the *smart growth* approach. It can also help the City to respond to their concerns.

The City can adopt the index tool and use it while reviewing proposed developments to highlight areas where developers can improve their design to create better infill housing.



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