[Image Source: *Complete Communities 2.0* (draft), p. 143]

Integrating Biophilic Strategies into the City of Winnipeg's Intensification Framework

Executive Summary

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BACKGROUNG & CONTEXT

Introduction

As one of the most important sustainability strategies within contemporary urban planning practices, intensification should be supported by a strong environmental component. Integrating biophilic strategies into intensification practices is fundamental to push urban growth to the right direction. Biophilic strategies emerge as a sustainability resource to integrate nature into cities "as an element of a meaningful urban life" (Biophilic Cities Network, 2022). The implementation of green roof policy requirements, the development of bird friendly design guidelines, and the increase of urban tree canopy coverage; are just a few examples of the diverse range of biophilic strategies that can be incorporated to enhance the presence of nature in intensified urban areas (Asadzadeh & Yousefi Ahmadchali, 2018; Beatley, 2017; Biophilic Cities Network, 2022).

The purpose of this research is to analyse Winnipeg's new intensification policy framework to identify opportunities for the incorporation of biophilic strategies or nature-based solutions. With *OurWinnipeg 2045* and *Complete Communities 2.0* at their approval phase, Winnipeg is in a crucial moment for the integration of biophilia into its future planning directions. The City of Winnipeg is aiming to achieve 50% of the city's next 25-year growth through intensification strategies within its new planning policy framework. While accommodating compact growth in serviced areas has the potential to minimize the impact on the use of resources, it also involves the risk of losing green spaces in contested urban areas and decreasing the quality of life of its residents.

Research Questions

1. What are the main benefits of biophilic strategies for intensified urban areas and what are the most common challenges to their implementation?

2. What environmental policies in *OurWinnipeg 2045* (draft) and *Complete Communities 2.0* (draft) could promote the transformation of Winnipeg into a biophilic city?

3. What environmental policies does Edmonton, being part of a Nature-focused Network, have to inform Winnipeg's intensification framework?

The Winnipeg Context

The context of this research is developed around three main factors. First, the pressure to increase housing supply as a result of the Canadian housing crisis. The City of Winnipeg would need to provide approximately 82,000 new dwellings to accommodate an increase of 160,700 people by 2040 (City of Winnipeg, 2021b). Second, the Winnipeg Metropolitan Region (WMR) is currently in the process of being established as the Capital Planning Region and adopting a regional development plan to direct growth and set common targets for its member municipalities (Province of Manitoba, 2020). As a WMR member, the City of Winnipeg will be required to update its development plan to comply to new regional density targets and natural assets management requirements. Third, recent federal commitments to support Nature-based Climate Solutions will promote the development of regional and urban forest plans, biodiversity protection, the expansion of protected areas, and the creation of a new Natural Infrastructure Fund (Nature Canada, 2021). Federal support is fundamental to the implementation of biophilic strategies since it can promote policy enforcement and represents a significant source of funding.

METHODOLOGY

Two research methods were developed to answer the previously outlined research questions: a literature reviw and a content analysis.

Literature Review

A literature review was conducted to answer the first research question: What are the main benefits of biophilic strategies for intensified urban areas and what are the most common challenges to their implementation? Document types reviewed included academic articles, institutional reports, and media publications, analysed to understand the complexity of intensification and biophilic concepts as well as the relationship between them. This part of the research helped to identify key themes shaping the framework for the following policy review.

Content Analysis

This part of the research involved reviewing the main planning documents of the City of Winnipeg as they reflect municipal priorities by providing direction on growth, development, and land use. The city of Edmonton was selected as a policy reference for this study based on its membership in the Biophilic Cities Network and its similarities to Winnipeg regarding geographical location, population size, and climatic conditions.

The first step of the research was to select a sample of key policy documents for each city. The second step was to identify those policies related to intensification practices and environmental sustainability, from each of the selected documents. The third and fourth steps were defined following the Berke & Conroy (2000) method for evaluating environmental policies in local plans. The third step consisted of classifying the selected policies into categories and a set of sub-categories for each.

Table 1 shows the organization of categories and sub-categories, as well as examples of related elements for each. Two high level documents were selected from each city. From the City of Edmonton, the selected documents were the *Edmonton City Plan* and the *Infill Roadmap 2018*, while from the City of Winnipeg the selected documents were *OurWinnipeg 2045* (draft) and C*omplete Communities 2.0.* (draft). The fourth step was to analyse policy strength for each sub-category based on the permissive or mandatory language of the selected policies. Finally, the fifth step consisted of scrutinizing the selected documents and their filtered policies from three different perspectives as suggested by Cardno (2018) for the analysis of policy content: policy purpose analysis, policy construction analysis, and practice implementation and impact.

Category	Sub-Category	Examples of Related Elements
Intensification	Location	Nodes, corridors, networks, open spaces.
	Connectivity	Walkability, access, transportation.
	Design	Compact design, mixed uses, public realm, amenities, housing diversity.
	Procedures	Stakeholders, timeframes, budget, indicators, targets.
Biophilia / Nature-based Solution	Natural Assets & Low Impact Development	Air, land, and water protection, servicing infrastructure, rain gardens, bioswales.
	Urban Green Spaces	Open spaces, parks, greenways, community gardens, urban agriculture.
	Tree Canopy	Street trees, private and public trees.
	Building Elements	Green walls, balcony gardens, green roofs.
	Biodiversity	Butterfly gardens, pollinator corridors, bird friendly design.
	Procedures	Governance, trade-offs, partnerships, regional approach, social programs, education, indicators, targets.

Table 1. Definition of Categories and Sub-Categories for Policy Classification.

Limitations

The first limitation was regarding the scope of the study. While the literature review includes examples from different countries, the content analysis was limited to Canadian practices (Edmonton). Only two high-level policy documents were analysed in detail, but each city has a long list of subsidiary plans that could merit review of environmental policies within their content. The study is also limited to local documents only, reviewing provincial and federal policies could provide a better understanding of the regulatory framework, as well as potential partnerships and funding opportunities. The second limitation was biased selectivity. The selection and classification of policies was subject to flexibility and subjectivity since some of the selected documents were lacking details. The third limitation was related to biophilia being an emerging concept, requiring interpretation of compatible key words or concepts that could set the framework for future implementation. Not enough documentation was found in regard to long-term results or implementation lessons from other cities.

RESULTS & ANALYSIS

Results

Results from the content analysis are divided into two parts, the first one for the City of Edmonton, as a reference for best practice, and the second one for the City of Winnipeg. Each part identifies the main characteristics from each document as well as the results from the policy classification and the policy strength analysis. Policies from these documents were selected for analysis based on their relation to intensification and biophilia as the two key topics in this research. Results are summarized in Table 2.

Results	Edmonton	Winnipeg
Policy Classification	The Urban Green Spaces sub-category was identified as a priority (41%) within biophilic-related policies in the City Plan. The Design sub-category was identified as a priority within intensification-related policies in the City Plan and in the Infill Roadmap 2018 as well.	The Implementation Procedures sub-category was identified as a priority (40%) within biophilic-related policies in OurWinnipeg 2045 (draft)(OW2045), while Urban Green Spaces in Complete Communities 2.0 (draft) (CC 2.0.). The Location sub-category was identified as a priority (33%) within intensification-related policies in OW2045, while Design and Implementation procedures were the most relevant (33%) in CC 2.0.
Policy Strength	Most of the selected policies (64%) from the City Plan showed a "suggested" language.	Most of the selected policies (56%) from both OW2045 and CC 2.0 showed a "suggested" language.
Relevant Observations	Big City Moves with specific targets and strategic measures ("Greener as We Grow" and "A Rebuildable City"); interconnected networks (district network, nodes and corridors network, green and blue network, and non-residential opportunities network); the Managing Growth section informs about the logistics of phasing growth over time.	Vision and goals framed by the 17 United Nations Sustainability Development Goals (SDGs); alignment with indicators from the Peg system, which is also based on the UN SDGs; "Environmental Resilience" and "City Building" identified as the more relevant goals for the purpose of the current research; new urban structure map identifying specific community and corridor types as optimal locations for intensification.

Table 2. Summary of Results from the Content Analysis Method.

Analysis

The results of the research were analysed using Cardno's (2018) policy analysis perspectives on purpose, construction, and implementation. Overall, coherence was identified among Edmonton's policy purpose, construction, and implementation actions. The analysis has shown how the identified policy priorities (i.e., UGS and biodiversity) led to the creation of a set of supporting guiding documents. Documents such as the *Infill Roadmap 2018* and *Breathe: Green Network Strategy*, have performed as tools to implement intensification and biophilic strategies across interconnected city networks. Through and integrated and incremental planning approach, Edmonton has been working to achieve biophilic goals - identified in the literature review - as a member of the Biophilic Cities Network.

In contrast, the analysis has shown Winnipeg is still behind Edmonton regarding the incorporation of biophilic and intensification strategies. With OW2045 and CC 2.0 at their approval stage, Winnipeg's intensification framework appears to be on its way to be detailed. However, the incorporation of biophilic strategies into this framework has not been identified as a priority. Even though environmental policies are shown as part of the purpose and goals of Winnipeg's policy documents; the "Environmental Resilience" goal is not being fully interconnected to intensification strategies and key locations within the urban structure (e.g., mature communities, corridors, transit stations). In regard to the implementation perspective, Winnipeg is going in the right direction by referencing its indicators to Peg and the UN Sustainability Development Goals. As noted in the literature review, settings common indicators is an efficient strategy to promote data sharing and identify best practice within international partnerships. The City of Winnipeg is in a crucial moment to strengthen its intensification framework with biophilic strategies and join Nature-focused networks to support it.

This analysis has provided an overview of the current Winnipeg status in relation to the presence of environmental policies within Winnipeg's new policy framework. By identifying policy strengths and weaknesses from both Edmonton and Winnipeg, the analysis has provided best practice and opportunity areas to inform key recommendations for Winnipeg's policy framework.

KEY RECOMMENDATIONS

The analysis of the findings from the literature review and the content analysis on Edmonton's and Winnipeg's policy framework, have led to a set of ten key recommendations for integrating biophilic strategies and NbS into Winnipeg's intensification framework.

1. Map Natural Assets and Create a Green Infrastructure Network across Mature Communities. Identify strategic areas lacking access to urban green spaces and incorporate biophilic urban acupunture (e.g., parks, greenways, green roofs, sidewalk gardens, etc.)

2. Design Seasonal and Contextual Biophilic Strategies. Develop biophilicc strategies that address Winnipeg's extreme and contrasting climating conditions throughout the year.

3. Support Intensification Policies through a Strong Regional Approch. Align objectives and indicators to facilitate data sharing and the achievement of common goals.

4. Integrate Biophilic Strategies within Risk Management and Resilience Programmes. Implementing biophilic strategies and NbS to address complex urban problems (e.g., flooding, drought, extreme heat) can provide access to additional funding resources.

5. Develop Clear and Comprehensive Implementation Tools. Secondary policy documents should be consistent and interconnected to achieve an efficient allocation of resources and promote interdepartmental and interjurisdictional partnerships.

6. Develop Indicators, Monitor Progress, and Evaluate Results Regularly. Develop measurable targets to improve and increase urban green spaces in densified areas and keep annual tracking of key green indicators (e.g, acres of parks, forests, major open spaces, and green infrastructure).

7. Create Public Demonstration Projects and Pilot Programmes. Start with small interventions at the neighbourhood scale, easure the cost of change and compare perfomance data to make benefits evident to the public.

8. Promote Education, Community Programmes, and Awareness-raising Activities. Raise awareness on the benefits of biophilis and get public support to mainstream policy implementation.

9. Join Nature-focused Networks and Create Partnerships. Nature-focused Networks can provide access to best practice, technical support, and funding.

10. Develop Legal Mechanisms to Increase Enforceability of Environmental Policies. Enforce or incentivise the implementation of biophilic strategies within the new intensification policy framework.

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