Urban Morphology as a Measure of Sprawl Repair Potential in Ottawa, Ontario

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Executive Summary

Overview

The rehabilitation of suburban landscapes, from car-centric, unsustainable sprawl, towards increasingly mixed-use, environmentally conscious growth, will come to define urban planning in the coming decades. Researchers and practitioners continue to hone in their efforts on repairing these segmented environments through design. Dated commercial centres are revealing their potential as spaces capable of supporting walkable, vibrant, and sustainable suburban nodes.

This report will examine the existing urban form of three study sites in Ottawa, Ontario, analyzing and comparing their relative potential for retrofit. The three study sites, Herongate Mall, Elmvale Acres, and Innes Crossing, sit to the south-east of the city's downtown core (Figure i) and they all exhibit characteristic features of suburban development, including land uses separated by busy arterial roads, and struggling retail centres surrounded by large surface parking lots, making them appropriate candidates for suburban retrofit research.
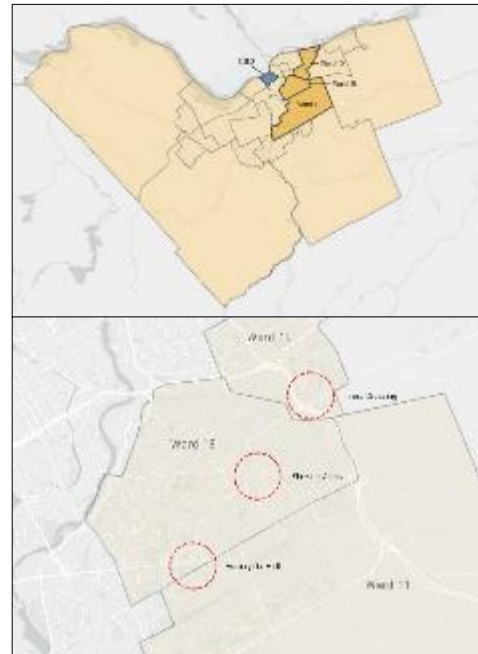

Figure i: Top – *A ward map of the City of Ottawa highlighting the wards containing the three study sites as well as their relation to the CBD (blue polygon).* **Bottom** – *The three study sites identified by the red circles and labeled accordingly. (Ward data provided by Open Ottawa)*

Methods

This research utilizes geographic information systems (GIS) in order to perform physical analyses of the three study sites and examine specific urban morphological features in order to compare relative retrofit potentials. Existing settlement patterns define how spaces can change as well as how different built-form characteristics influence redevelopment feasibility over time. This analysis pays particular attention to *urban tissue* and *sustainable urban forms* as they relate to retrofit potential.

Table i: *Illustrative depictions of different tissue types from both Scheer (2001) and this study.*

	Static	Elastic	Campus
Scheer (2001)			
Saunders (2022)			

Urban tissue is defined by the aggregation of parcels and blocks that share similar built-form characteristics, allowing for comparisons across the three types of tissue (see Figure ii) – static tissue, elastic tissue, and campus tissue. Static tissue is defined by the collection of small lots with high lot coverage, usually found in the form of residential subdivisions (see Table i). Their rigid ownership structures and built-form characteristics discourage large-scale redevelopment, giving them the lowest potential for retrofit. Elastic tissue is characterized by irregular-sized lots and varying lot

Herongate Mall	Elmvale Acres	Innes Crossing

Figure ii: *These images display the relative distribution of the three tissue types across the study sites. The red areas represent static tissue, the purple areas represent elastic tissue, and the green areas represent campus tissue.*

coverages (see Table i), existing primarily as commercial strips along arterial roads. This tissue type is susceptible to change but is sometimes limited due to the varying ownership arrangements. Campus tissue presents the greatest retrofit potential across the three types of urban tissue. Characterized by large lots with multiple buildings and low lot coverage (see Table i), these built-form features and single-ownership arrangements allow for large scale redevelopment to proceed with relative ease.

Alongside the urban tissue analysis, a *strengths and weaknesses evaluation* of existing sustainable urban forms, provided through methods by Emily Talen, developed site-specific recommendations for each study area. This analysis will examine five features of the existing urban form (connectivity, accessibility, density, diversity, and parking), deriving quantitative measures, helping to prioritize recommendations and focus potential retrofit opportunities.

Results

Table ii: Summary of results from urban tissue analysis and sustinable urban form evaluation.

Analysis Data Summary Table

		Herongate Mall	Elmvale Acres	Innes Crossing
	*Retrofit Potential Score**	5.34	4.67	5.28
Strengths and Weaknesses	*Street Centreline Length***	13,434 m	20,365	11,426 m
	Intersection Density$_\dagger$	0.16 / ha	0.20 / ha	0.11 / ha
	Accessibility$_{\dagger\dagger}$	550 parcels	657 parcels	390 parcels
	Housing Diversity$_\S$	0.69	0.51	0.52
	Gross Density$_{\S\S}$	11.2	12.3	2.8
	Parking❖	10%	10%	24%

Directionality of scoring measures: * 1 = Lower retrofit potential; 10 = Higher retrofit potential, ** Higher = Greater existing connectivity, † Higher = Greater existing connectivity, †† Higher = Greater accessibility, § Higher = Greater diversity of housing types, §§ Dwelling units per hectare, ❖ Higher = Greater opportunity for infill development

Recommendations

Based on the results from the tissue analysis, and supplemented by the strengths and weaknesses evaluation, the Herongate Mall study area was deemed to have the greatest retrofit potential across the three study sites. Table ii displays the results from both analysis methods. Recommendations for

specific features within each study area that exhibited the greatest opportunity or need for retrofit, will follow.

Herongate Mall Recommendations

1a: *Prioritize areas surrounding mall for redevelopment*

2a: *Improve both north-south and east-west connectivity*

3a: *Intensify elastic tissue and vacant parcel south of mall*

Elmvale Acres Recommendations

1b: *Prioritize infill development in mall site and parking lots*

2b: *Improve connectivity within mall site*

3b: *Reconsider utility of underutilized land and elastic tissue*

Innes Crossing Recommendations

1c: *Focus Development on mall site and along Cyrville Road*

2c: *Housing Diversification – Missing Middle*

Conclusion and Future Implications

This pilot study has expanded the use of these methods to include Ottawa, Ontario, in comparing and measuring the retrofit potential across three commercial sites. This report continues to explore the utility of these methods in measuring developmental potential and encouraging sprawl repair through thoughtful design. The primary limitation faced by these methods is the exclusive focus on built form while neglecting other political, financial, and geotechnical constraints on development. The next steps in exploring the utility of these tools lie in implementing GIS automation in order to expand the scope of analysis to include entire regional contexts.