Urban Planning
2026 • Volume 11 • Article 12086
https://doi.org/10.17645/up.12086

cogitatio

ARTICLE

Open Access Journal

Compact or Balanced: Evaluating Spatial Contradictions in Population and Housing Objectives Within Irish Planning Policy

Michael K. Hayes

School of Architecture, Planning and Environmental Policy, University College Dublin, Ireland

Correspondence: Michael K. Hayes (michael.k.hayes@ucd.ie)

Submitted: 1 February 2026 **Accepted:** 22 July 2026 **Published:** 17 September 2026

Issue: This article is part of the issue "Suburban Development and City Extensions" edited by Henriette Bertram (TU Braunschweig), Angela Million (TU Berlin), and Uwe Altrock (University of Kassel), fully open access at https://doi.org/10.17645/up.i513

Abstract

Following publication of the National Planning Framework, over the past decade, Irish urban design and planning policy has increasingly embraced the language and strategies of compact growth. This shift has occurred within the context of a much longer history of national spatial planning, in which the objective of "balanced" regional development has persisted despite changing ideas about the spatial form that balance should take. This article argues that the National Planning Framework represents a multi-scalar reorientation in Irish planning policy, promoting regional concentration with settlement-scale compaction, in contrast to previous strategies of decentralised sprawl. Yet little attention has been given to whether these objectives are mutually consistent, or to how they are shaping actual patterns of development. To address this gap, the article evaluates recent population and housing outcomes against stated policy targets and maps urban expansion across Ireland's three regions. It asks what spatial forms are emerging, whether planning objectives are being met, and whether these outcomes align with Ireland's compact growth ambitions.

Keywords

compact growth; regional development; spatial policy; urban expansion

1. Introduction

Since the mid-20th century, the Irish state has pursued a policy of "balanced" regional development. This objective has been pursued through government Acts, agencies, committees, and reports that have sought to control or mitigate the growth of the Dublin region in favour of less concentrated development at the national scale (Walker, 1987). National spatial plans have had the role of recommending a future physical pattern of settlement concentration and distribution that might best deliver on these ambitions.

The National Planning Framework (NPF), first published in 2018, is the most recent iteration. Since its adoption, national planning policy in Ireland has increasingly embraced the language and strategies of compact growth (Department of Housing, Local Government and Heritage, 2024; Department of Housing, Planning and Local Government, 2018; Government of Ireland, 2024).

The NPF combines two related but distinct spatial objectives. At the regional scale, it seeks to concentrate population and employment growth towards select centres. At the settlement scale, it seeks more compact, contained forms of urban expansion.

Prior research has examined the NPF in relation to its historical significance, statutory framework, governance arrangements, and wider policy context (Kayanan et al., 2025; Lennon et al., 2018; Russell & Williams, 2021; Walsh, 2019; Williams & Nedović-Budić, 2023). Few have evaluated the plan's objectives within an explicitly spatial framework (with the exception of Cahill, 2025; McCafferty, 2019). Consequently, there is limited evidence as to whether the strategy's goals are internally consistent, in terms of their projected impacts, or externally feasible, given the structure of the existing Irish urban system.

This article addresses the issue by asking: To what extent is the NPF delivering its objectives of "balanced" growth through concentrated regional development and compact settlement form?

To answer this question, the study undertakes a conformance-based ex post evaluation of the NPF's core spatial objectives—the first to systematically do so—and presents a unique multi-scalar conceptual framework for this purpose.

The article makes a key methodological contribution in proposing a simplified, accessible measure of settlement-scale compactness that can identify whether new development is increasing density and reducing fragmentation, or contributing to more dispersed urban form.

Results demonstrate that policy conformance at the national level can obscure substantial variation across regional and settlement scales. They also show how "balanced" growth targets can undermine compact settlement objectives in cases where the existing urban system is unable to accommodate allocated benchmarks.

The article proceeds as follows. Section 2 situates compact growth within international and Irish spatial planning debates, and introduces a multi-scalar spatial framework that provides the conceptual basis for the research question. Section 3 evaluates recent population and housing outcomes against relevant National Policy Objectives (NPOs). Section 4 develops and applies a method for assessing settlement-scale compactness. Section 5 discusses the implications of the findings for Irish spatial policy and for the evaluation of compact growth objectives more broadly.

2. Policy Context

2.1. International Adoption of the Compact City

The compact city is typically described as a spatially contained or contiguous urban settlement comprising mid- to high-density built form, a diverse mix of land uses within close proximity to residential units, and extensive

public transport provision (OECD, 2012; Thomas & Cousins, 1996). This definition is occasionally extended to specify morphological features such as building/plot structure and street network connectivity (Ahlfeldt et al., 2018; Neuman, 2005).

A primary justification for the promotion of compact city principles is the potential to reduce human-induced carbon emissions due to an associated adoption of less energy-intensive activity patterns (Frey, 1999). This conclusion is based on a number of interrelated impacts, drawing a link between settlement form and inhabitants' actions. In short, urban containment is intended to encourage proximity, while protecting undeveloped lands; density supports the provision of public transport and a diversity of services—and vice versa. Together, these properties are expected to result in the preservation of rural areas, improved accessibility, a decrease in the average number and length of journeys, and a reduction in greenhouse gas emissions per km travelled (Ahlfeldt et al., 2018; Burton, 2002; Frey, 1999; Jabareen, 2006; Thomas & Cousins, 1996).

Historically, claims to such impacts have been perceived to lack empirical research (Breheny, 1996; Jenks et al., 1996), yet this has not prevented the compact city from becoming embedded in spatial policy internationally in recent decades.

In the European context, the early promotion of the "'traditional' dense and mixed-use European city" (Frey & Yaneske, 2007, p. 34) emerged as a formal design response to the Brundtland Report (Brundtland, 1987) via the publication of the *Green Paper on the Urban Environment* (Commission of the European Communities, 1990) by the European Commission. Concurrently, compact city principles have been translated into distinct policies and practices at national level since the 1980s (de Roo, 2000; Ding et al., 2018), proliferating up to the present day (Büttner et al., 2024; OECD, 2012).

Similarly, the compact city remains a core component of European spatial policy (Katurić, 2025), while it continues to be promoted by a range of global organisations (Goddard et al., 2024; Yemeru et al., 2024). Such that compact city policies are arguably established as the hegemonic model of sustainable urban form (Haarstad et al., 2023).

2.2. The Compact City in Irish National Spatial Policy

Relative to this international policy context, Irish spatial planning has followed a similar, if specific, path towards the adoption of compact city principles.

Recommendations for compact, mixed-use city centres, with access provided through improved public transport links, stretch back to at least the 1980s (Bannon & Eustace, 1981).

A number of features common to the compact city have "enjoyed a central place in policy discourses on sustainable urban development" in Irish spatial planning at national and regional scales since the 1990s (McInerney & Walsh, 2009, p. 208). However, application has tended to emphasise a singular aspect—urban containment (Department of Environment, Heritage and Local Government, 2009; Government of Ireland, 2002).

This remains the case within the current spatial policy framework, enacted following publication of the NPF (Government of Ireland, 2018). An understanding recently codified, with compact growth now defined in Irish planning law as any form of development located within an existing settlement boundary (Government of Ireland, 2024).

Significantly, while the NPF was not the first Irish spatial policy document to reference compact city ideas, it has reframed the question of settlement-scale growth from local development planning to a national objective (Williams & Nedović-Budić, 2023).

Within this reframing, compact growth is presented as an antidote to more de-concentrated forms of urban expansion (Department of Housing, Local Government and Heritage, 2024; Department of Housing, Planning and Local Government, 2018). A response to Ireland's well-documented association with sprawl, particularly during the 1990s and 2000s (OECD, 2018; Siedentop & Fina, 2012).

In large part, the suburbanisation of recent decades has been associated with the expansion of Dublin and its surrounding hinterlands (for example, see McDonald, 2006; O'Brien, 2007). As such, strategies to contain sprawl are implicitly linked to a longer-term national objective concerning "balanced" regional development. In this context, compact city principles within Irish planning can be interpreted in terms of debates regarding the optimum spatial pattern to support more equitable growth at the inter-regional level.

2.3. The Origins and Implementation of "Balanced" Growth

From the 19th century onwards, an increasing concentration of population to the east of the country has occurred, largely driven by growth in the capital and its hinterlands (Brady Shipman Martin, 2000; Hayes, 2025). The extent of this movement has historically raised concerns regarding rural depopulation and an "unbalanced increase" in urban settlements, particularly Dublin (Newman, 1967, p. 13).

Strategies to underpin more even regional growth have oscillated between "centralist" and "dispersionist" camps (O'Neill, 1973). The centralist approach is evident in national spatial plans, wherein a select number of larger settlements are identified in which to concentrate growth.

For example, the country's first national-scale spatial policy, *Regional Studies in Ireland* (Colin Buchanan & Partners, 1968), incorporated a "growth pole" paradigm; widely adopted by international planning practice at that time (King & Golledge, 1978). The plan identified centres with the objective of strengthening regional urbanism and offering improved opportunities to the surrounding hinterland (Turpin, 1967). The report proposed a five-level grouping of towns—in addition to the cities of Dublin, Cork, and Limerick—based on their development potential.

Similarly, Ireland's second national-scale plan—the National Spatial Strategy—proposed a settlement hierarchy of Gateways and Hubs, defined according to population size and service provision. This included five "Existing Gateways" (equivalent to the five cities), eleven "New Gateways," and five "Hubs" (Government of Ireland, 2002). The approach was influenced by contemporary European spatial policy concerns related to regional clusters and polycentricity (Doyle, 2025).

Both national-scale spatial plans were commissioned or published by the state, yet neither was issued on a statutory basis. Consequently, their realisation was limited, and even undermined by subsequent government policy that prioritised regional dispersion (MacFeely et al., 2011; Walsh, 2019).

This dispersionist approach was pursued through more sectoral and employment-focused policies, distributing potential growth over a much wider area to include small and medium-sized settlements (for examples, see: Department of Economic Planning and Development, 1979; Houses of the Oireachtas, 1999; Industrial Development Authority, 1972).

Viewed in this light, the National Planning Framework may be understood as the most recent iteration of the centralist approach. Just like its predecessors, the NPF adopts the strategic goal of "balanced" development, seeking to achieve this by focusing growth within the nation's five cities, alongside the identification of five Regional Growth Centres (Figure 1).

If centralist and dispersionist policies are viewed as a continuum (O'Farrell, 1974), the NPF is the most "centralised" of Ireland's three national spatial strategies in that it designates a total of 10 settlements for growth. This is compared to 34 (Colin Buchanan & Partners, 1968) and 21 (Government of Ireland, 2002), respectively.

2.4. A Spatial Framework for Interpreting Planning Policy

The preceding discussion has identified the primary spatial scales and patterns that have emerged as the preserve of national-level planning policy in Ireland.

These two dimensions provide the basis for the spatial framework used in this article (Figure 2). Regional centralisation and settlement compaction together describe the model of compact, concentrated growth now promoted by the NPF. Regional dispersion and settlement sprawl describe the "deconcentrated and decentralised urbanisation" of past policy and practices (McCafferty, 2019, p. 82).

This framework thereby situates the NPF within the wider history of Irish planning policy while also providing a basis for evaluating its contemporary objectives. It emphasises the multi-scalar nature of the NPF and the degree of change required to deliver the strategy's spatial ambitions.

Since evaluation requires attention to both dimensions simultaneously, this article asks: To what extent is the NPF delivering its objectives of "balanced" growth through concentrated regional development and compact settlement form?

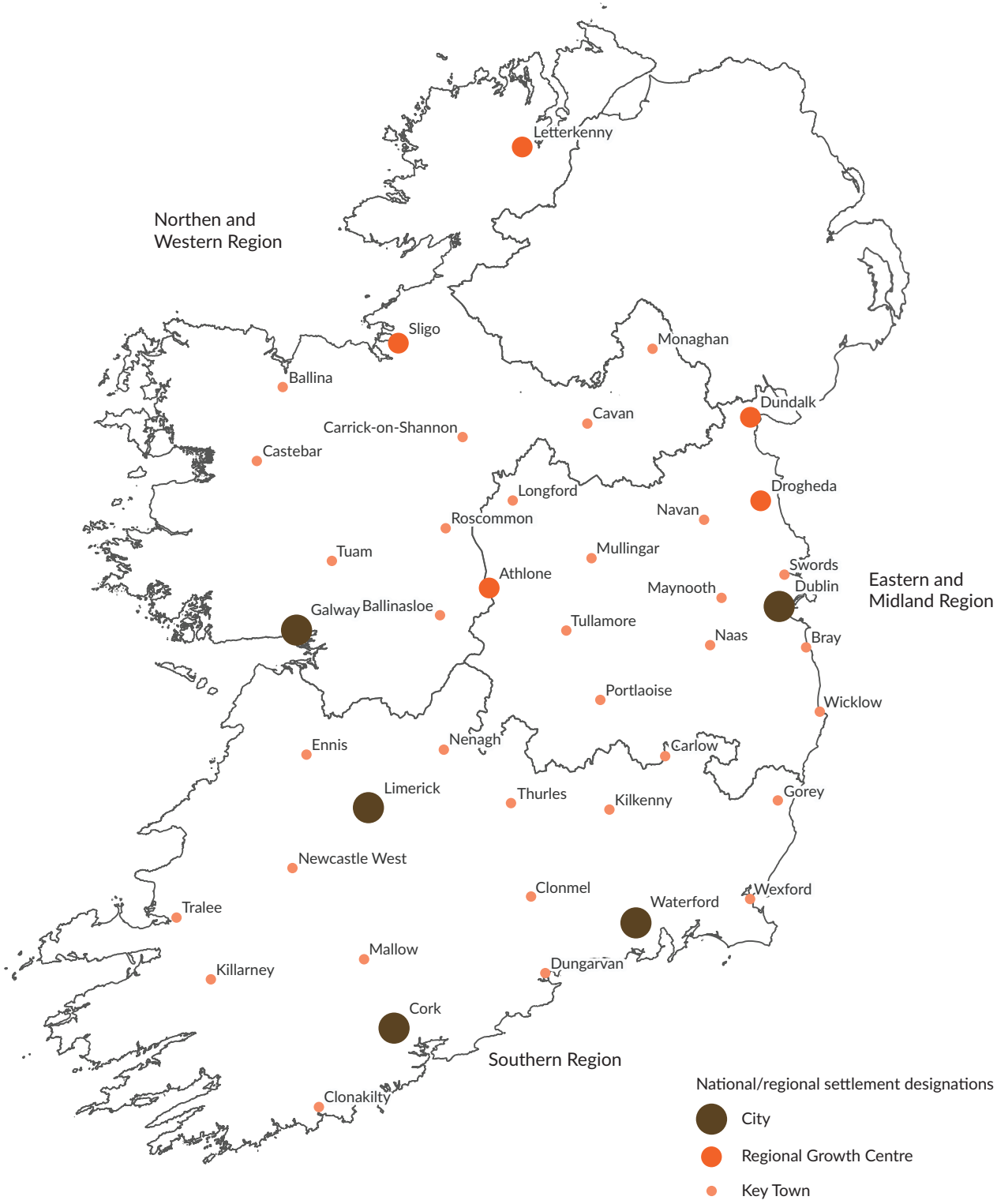

Figure 1. Map of current national and regional settlement designations. In total, 32 Key Towns have been assigned by the three regional authorities.

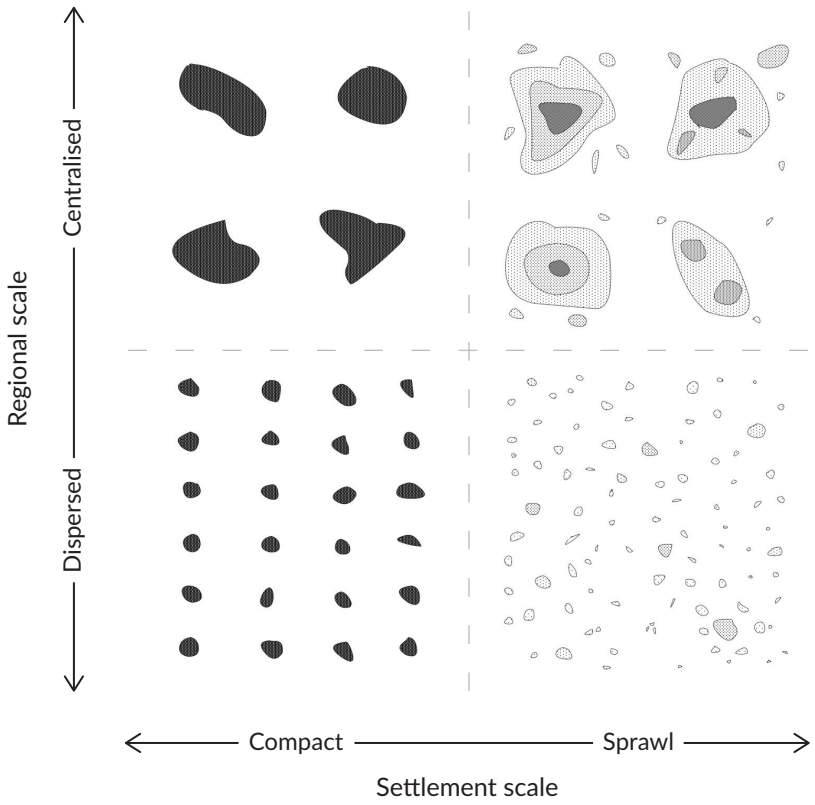

Figure 2. Multi-scalar spatial framework diagram, illustrating growth patterns according to regional-scale centralisation/dispersion and settlement-scale compactness/sprawl. Note: Darker tones represent higher densities.

3. Plan Evaluation

3.1. Method Overview

To answer this question, the article follows a conformance-based approach to ex post plan evaluation.

Planning evaluation, in general terms, involves "the systematic assessment of plans, planning processes, and outcomes compared with explicit standards or indicators" (Laurian et al., 2010, p. 741). Ex post evaluation is focused on plans after implementation and seeks "to determine whether the plan achieved its stated goals and objectives" (Guyadeen & Seasons, 2018, p. 101). One approach to ex post evaluation is conformance-based assessment, which focuses on the alignment between a plan and subsequent physical development patterns (Laurian et al., 2004; Mastop & Faludi, 1997).

Conformance-based evaluation is deemed particularly appropriate for morphologically related research (Talen, 1997), providing information that can be reviewed for the purposes of amending policy (Shahab et al., 2019).

The method undertaken in this article involves two parts. First, the three NPOs concerned with "balanced" growth, regional centralisation, and compact settlement form are identified. These are analysed using recent population and housing data to confirm the level of conformance achieved. Second, where policy metrics are unable to measure intended outcomes (i.e., compact growth), a new method for quantifying changes in

urban compactness/sprawl at the settlement scale is proposed. The results of this analysis are discussed in the final section.

3.2. Data

3.2.1. Population Data

Population data are sourced from the Central Statistics Office (CSO) and based on national census results. Total population figures have been collected at the sub-regional (NUTS3) level and aggregated at the regional (NUTS2) scale (CSO, 2022a, 2023b). Urban population figures have been collected for individual settlements and aggregated at the regional (NUTS2) scale (CSO, 2022b, 2023c).

3.2.2. Urban Area Data

In Ireland, the CSO classifies all settlements with a population equal to or greater than 1,500 as "urban." This definition is adopted for the purposes of this article.

The study adopts the 2016 CSO definition of an "urban area," involving a minimum cluster of 50 occupied dwellings, with a maximum distance of 100 m to the nearest building, and evidence of an urban centre (in terms of service provision; CSO, 2017).

The standardised CSO method of boundary delineation in 2016 involved the extension of existing "urban areas" where an occupied dwelling lay within a 100 m proximity threshold (CSO, 2012). Although the CSO approach to boundary delineation changed in 2022, population data from 2022 have been made available for the 2016 boundaries. For consistency, the 2016 settlement boundaries are the version referenced in this article.

3.2.3. Housing Data

The assessment of dwelling completions, 2016–2024 (Section 3.4.2.3), refers to CSO tables NDA02 (dwelling completions by type per county) and NDA12 (dwelling completions by type per settlement).

For the settlement compactness analysis (Section 4), Geodirectory's GeoBuilding Intel dataset is used (GeoDirectory, 2025). This provides geolocated point data for each individual address in the country with key variables including unit and building use (commercial or residential) and year of construction. This information was overlaid with NUTS2 regional boundaries (https://data.gov.ie/dataset/nuts2-boundaries-ungeneralised-national-statistical-boundaries-2015) and CSO settlement boundaries (per the 2016 census), provided by Táilte Éireann and available for download (https://data.gov.ie/dataset/settlements-ungeneralised-national-statistical-boundaries-2015).

3.3. The NPF

The NPF sits at the highest level of Ireland's hierarchically structured plan framework (Office of the Planning Regulator, 2022). Notably, the NPF is the first national spatial plan to be issued on a statutory basis,

underpinned by legislation (from 2010) that requires local development plans to align with national and regional strategies (Russell & Williams, 2021). This places it in a relatively unique position, historically, to deliver a coordinated, multi-scalar planning strategy.

The NPF sets out National Strategic Outcomes (NSOs) and associated investment priorities until 2040. These goals are outlined in terms of NPOs, of which there were 75 in 2018. This article will focus on those NPOs concerned with "balanced" regional development (NPO 1); the centralised distribution of population (NPO 2a); and compact settlement-scale growth (NPO 3).

These NPOs are significant in introducing performance-based metrics to Irish national spatial planning, utilising multi-scalar indicators across two key areas: population targets and housing location benchmarks.

3.4. Review of NPOs

3.4.1. Description of Measures and Goals

3.4.1.1. NPO 1: Regional Population Targets

NPO 1a requires that population and employment growth in the Eastern and Midland Region will be equal to growth in the Southern Region and Northern and Western Region combined. NPO 1b sets out projected future population figures for each region, while NPO 1c provides the same detail for employment.

3.4.1.2. NPO 2a: City Population Targets

NPO 2a states that 50% of national population and employment growth must be situated within the five cities of Dublin, Cork, Limerick, Galway, and Waterford. The NPF provides the exact population ranges per city in section 2.6 (Government of Ireland, 2018, p. 29).

3.4.1.3. NPO 3: Housing Benchmarks

NPO 3a requires that 40% of all new dwellings nationally be located within the built-up area of existing settlements. NPO 3b requires that 50% of new dwellings allocated to the five cities must be within their existing built-up area. NPO 3c requires that, for all other categories of settlement, 30% of new dwellings must be located within their existing built-up area.

The link between population targets and housing location benchmarks is interpreted to mean that 25% of new dwellings nationally must be developed within the five cities, and 15% of new dwellings nationally must be developed in other settlements (Government of Ireland, 2018, p. 176).

3.4.2. Policy Evaluation

3.4.2.1. NPO 1: Regional Population Targets

In applying a 50/50 split to future regional population growth, the goal of NPO 1 reflects the long-term spatial planning ambition of ensuring "balanced" development. Given the current distribution of population across

the three regions, if achieved, the policy would result in the maintenance of the status quo, with regional shares of national population unchanged.

Regarding recent performance, for the 2016–2022 period, growth in the Eastern and Midland Region was 54.7% of the national total. This was in line with multiple population projection studies, predicting that the Eastern and Midland Region will account for between 55.6% (Bergin & Garcia-Rodriguez, 2020) and 58.5% (Morgenroth, 2018) of total population growth to 2040. These projections mirror growth rates over recent 20-year cycles as well; between 2002 and 2022, the Eastern and Midland Region accounted for 55% of national population increase; between 1981 and 2002, it was 56.25%.

Population targets for each region also contrast significantly in relation to their respective urban systems. Removing city populations and targets from the analysis, the NPF proposes population growth equivalent to 59.1%–66.5% of the 2016 urban population for the Northern and Western Region, 34.1%–36.3% in the Southern Region, and 34.8%–35.5% in the Eastern and Midland Region.

The greater figure ascribed to the Northern and Western Region can be linked to differences in the urban system of each region (Table 1), where significant contrasts in settlement size and density combine with distinct patterns of concentration and dispersal (Figure 3).

Table 1. Regional-scale review of the Irish urban system by settlement size, 2016.

Region	Settlement type								
	1,000,000+	200,000+	100,000+	50,000–99,999	20,000–49,999	10,000–19,999	5,000–9,999	1,500–4,999	Non-urban
	Settlement count								
Eastern and Midland	1	0	0	0	12	11	17	38	152
Southern	0	1	0	2	5	8	15	45	312
Northern and Western	0	0	0	1	0	5	8	31	182
	Average population density of settlements (persons/km²)								
Eastern and Midland	3,677	—	—	—	2,704	2,441	2,920	1,595	1,028
Southern	—	1,197	—	1,349	1,545	1,928	1,572	1,093	991
Northern and Western	—	—	—	1,475	—	1,495	1,030	999	747
	Percentage of settlement population								
Eastern and Midland	59.1%	—	-	—	16.8%	7.4%	6.7%	5.3%	4.6%
Southern	—	21.7%	—	15.4%	12.5%	11.1%	11.4%	12.3%	15.7%
Northern and Western	—	—	—	21.1%	—	18.9%	13.9%	20.8%	25.4%

Notes: Settlement data are provided for three properties—the number of each settlement type within a region, the average population density of each settlement type, and the percentage of population distributed by settlement type relative to the total settlement population; settlement classes follow the size category structure found in prior research (McCafferty, 2019) and policy (Department of Housing, Local Government and Heritage, 2024).

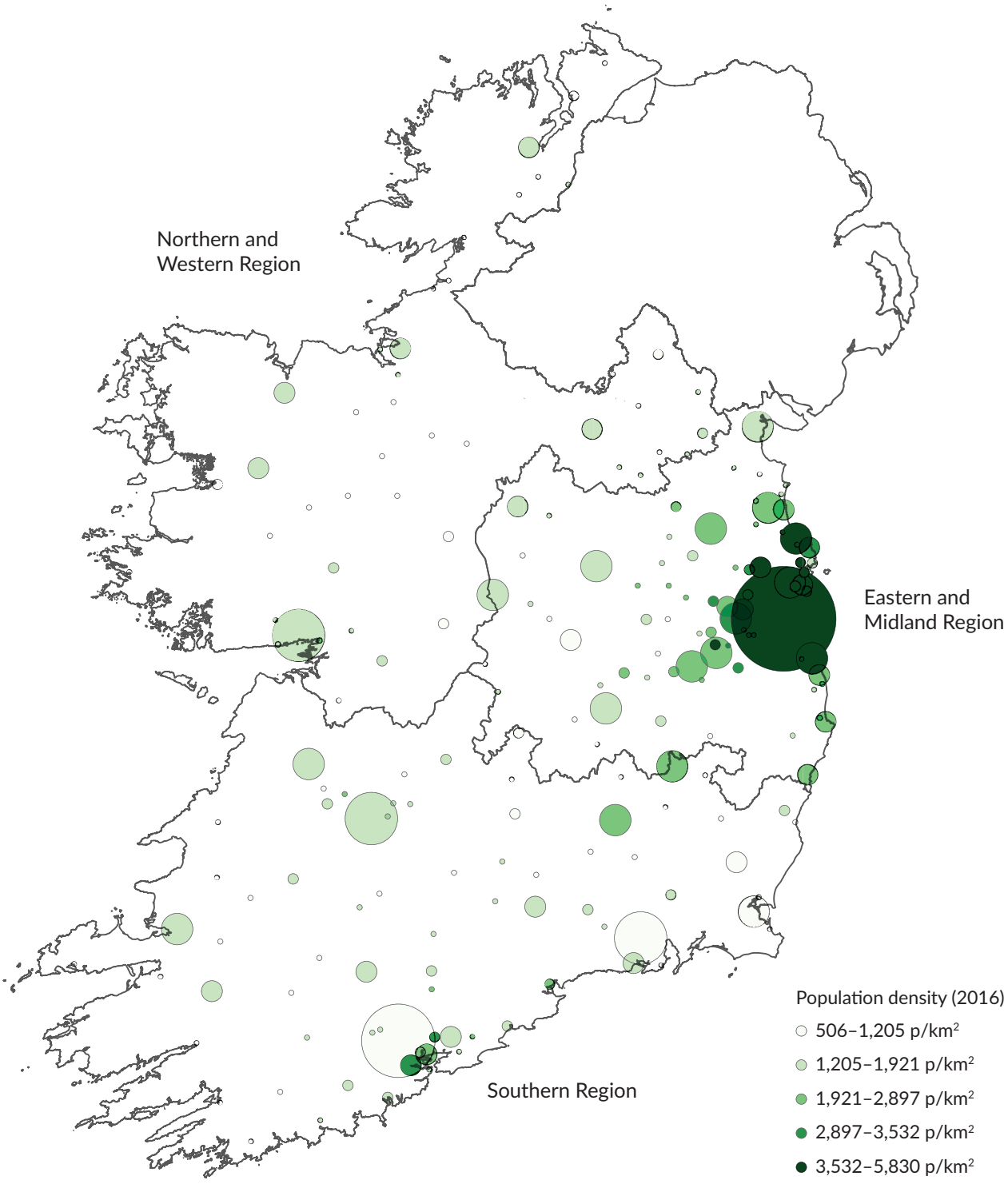

Figure 3. Map of population density for all urban settlements, 2016. Note: Area of circles represents settlement population size.

This suggests a spatial policy objective that has failed to acknowledge existing differences across regional urban systems. A likely consequence is that the majority of growth allocated to the Northern and Western Region will occur in peripheral or rural locations, thereby undermining compact growth.

This outcome is reinforced by the NPF's settlement-scale housing targets (NPO 3), wherein lower urban containment requirements are associated with smaller settlements (15% for towns versus 25% for cities). Regions with more dispersed urban systems are therefore granted an allowance to disperse further, in contrast with more concentrated regions.

3.4.2.2. NPO 2a: City Population Targets

Between 2016 and 2022, 32% of national population growth occurred within the built-up area of the five cities, falling substantially short of the 50% target set out by NPO 2a. Growth in Dublin accounted for 71.2% of all city increases, which is reflective of its starting share of 72.9% of total city population and demonstrates little change in development between the capital and the second-tier cities.

In comparison to the five cities, 45.5% of national population growth took place in towns (1,500–50,000 in size) and 22.4% in non-urban areas during the 2016–2022 period, illustrating the continuation of population trends since the 1960s (McCafferty, 2019).

At an individual settlement level, the most ambitious population growth targets set out by the NPF are for the cities of Cork, Limerick, Galway, and Waterford, equalling a 50%–60% increase to 2040 or "two-and-a-half times the long-term historical growth rate of these centres combined" (McCafferty, 2019, p. 86). If 2016–2022 growth rates were to continue, only Dublin, Limerick, and Waterford would be on track to attain their allocated population increases.

3.4.2.3. NPO 3: Housing Benchmarks

Between 2016 and 2024, the percentage of dwellings built within existing settlements has averaged 75.5% nationally. The result is that the target set by NPO 3a has been easily met. However, it should be noted that these figures are for all settlements, regardless of size (i.e., both "urban" and "rural" classified settlements are included).

For all urban settlements, between 2016 and 2024, 69.7% of dwellings were completed within existing built-up footprints. For all settlements with a population of 5,000 or greater, this figure was 62.24%.

The national benchmark also obscures significant regional differences, with these disparities widening as settlement size increases (Table 2).

Table 2. Regional differences for dwelling completions within built-up footprints, 2016–2024.

Region	All settlements	Urban settlements	Settlements >5,000
Eastern and Midland	85.9%	82.6%	73.6%
Southern	65%	55.1%	46.8%
Northern and Western	45.7%	36%	24.4%

This suggests that national-level benchmarks are ineffective at promoting settlement-scale compactness, with the Eastern and Midland Region achieving double the target figure, and the Northern and Western Region four percentage points below for urban settlements.

Similarly, while NPO 3b has been achieved—in that 36.8% of national dwelling completions occurred within existing city boundaries between 2016 and 2024—the Southern Region and Northern and Western Region failed to meet the benchmark. For the Eastern and Midland Region, 48% of dwelling completions were located within the Dublin built-up footprint. In the Southern Region, 23.4% took place across Cork, Limerick, and Waterford cities. In the Northern and Western Region, 9.3% of dwellings were built in Galway city. These results illustrate that regional-scale concentration has yet to materialise beyond the east of the country.

The difference in dwelling location figures between Dublin and the second-tier cities may be linked to apartment construction. Dublin accounted for 77% of all apartment construction nationally between 2016 and 2025. In comparison, approximately 6% of all apartment construction took place within the remaining four cities over the same period.

This may also relate to the dwelling location figures for other settlements (NPO 3c), which were more evenly spread (Table 3), due perhaps to less deviation in the size and density of dwelling type across Ireland's towns. While the target was reached—with 38.1% of dwellings completed within the built-up footprint of non-city settlements between 2016 and 2024—the difference in performance when limited to "urban" settlements suggests substantial development is taking place in small "non-urban" settlements in the Southern Region and Northern and Western Region. This points to a further undermining of regional centralisation objectives.

Table 3. Regional differences for dwelling completions within non-city built-up footprints, 2016–2024.

Region	Non-city settlements	Non-city urban settlements
Eastern and Midland	37.9%	34.6%
Southern	41.7%	31.8%
Northern and Western	36.3%	26.6%

4. Assessing Settlement Compactness

4.1. The Need for Better Compact Growth Indicators

The preceding analysis demonstrates that benchmarks aggregated at the national level or by settlement type (as per NPO 3) are unable to document variations in growth trends for individual urban areas.

Limitations to this approach have been noted previously; in the 1990s, the UK published similar targets for compact settlement growth based on a percentage of new housing located on brownfield sites (Brown et al., 1998). This metric has been criticised for failing to quantify the compactness of new development, as well as being unable to describe the impact of development trends on changes to aggregate compactness at the individual settlement level (Burton, 2002).

To better record and investigate settlement-scale growth trends, this article proposes a new method of measurement. In doing so, it responds to recent government proposals to establish new approaches to monitoring compactness (NPO 106; Government of Ireland, 2025).

4.2. Indicator Requirements

The method survey focused on settlement-level indicators of urban containment relevant to NPO 3, in line with the interpretation of compact urban development in Irish spatial policy.

Previous reviews suggest two primary dimensions of morphological compactness/sprawl common across the literature: density and fragmentation/contiguity (European Environment Agency & Swiss Federal Office for the Environment, 2016; Galster et al., 2001; Jabareen, 2006). (Note that the terminology used varies across studies, though principles are similar.)

While a certain degree of agreement is evident regarding the categories of measurement, less clear are the precise metrics that ought to be adopted. To guide the process of developing density and fragmentation indicators, established suitability criteria for urban sprawl/compactness indicators were followed.

These include requirements that metrics be intuitively understandable; mathematically simple; modest in their information demands (Jaeger et al., 2010); relevant to policy; analytically sound; and based on retrievable data (OECD, 2012).

4.3. Method

The method of measuring settlement compactness comprises two indicators: "unit density" and "cluster density." Measurement was restricted to the unit of residential dwellings per hectare (dph) due to its integration in Irish spatial policy as a primary descriptor of compact growth. The period of evaluation was 2020–2025 to allow for a natural delay in the potential impact of the NPF since 2018.

Values for each indicator were calculated for all urban areas as identified in the 2016 census, equating to 200 settlements. Variables were calculated for the pre-2020 and 2020–2025 periods. Values were compared between both datasets. Degrees of difference were used to identify the extent to which a settlement had become more or less compact during this time. These data are available to view as Supplementary Material.

4.3.1. Compactness Indicators

"Unit density" measures the aggregate number of dwellings for all clusters within a settlement boundary relative to the total area of all clusters. It acknowledges that infill development will increase the overall unit count with little or no increase in cluster area. Peripheral expansion will increase unit count alongside a greater increase in cluster area. Leap-frog development will increase unit count but will result in the greatest relative increase in cluster area.

At the settlement scale, the aggregation of unit density alone can conflate differing development scenarios. A leap-frog development with high unit density could result in a similar value to an infill scheme with an associated lower number of units.

To account for this, the "cluster density" metric measures the number of residential clusters per square km within a settlement boundary. This indicator has some precedent within the literature (OECD, 2018; Schneider & Woodcock, 2008). It assumes that an increase in the number of clusters points to a more fragmented settlement form, while a decrease demonstrates compaction as existing clusters combine due to infill development.

4.3.2. Cluster and Boundary Definitions

The method for defining clusters and settlement boundaries is adapted from the CSO's current "built-up area" approach to delineation (CSO, 2023a) and amended for the purposes of this study.

Clusters were defined as residential units within 65 m of each other. The minimum cluster size was one unit (i.e., a single one-off house). Clusters within a shared settlement boundary were joined. A new settlement boundary was established by setting a 500 m buffer around each grouping of settlement clusters. Any additional clusters within this area were added to the settlement for evaluation (Figure 4). The new boundary was intended to ensure that non-contiguous development was included in the compactness metrics (Figure 5).

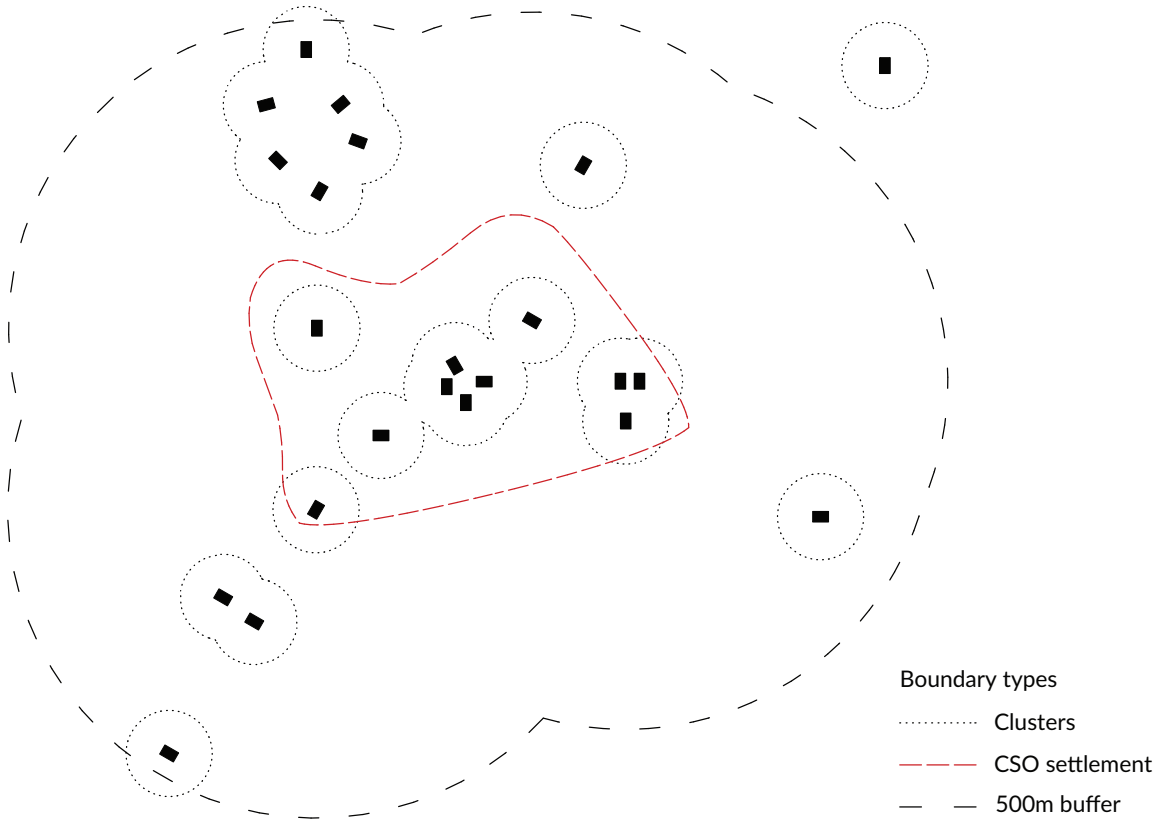

Figure 4. Diagram illustrating the method used for defining clusters and settlement boundaries.

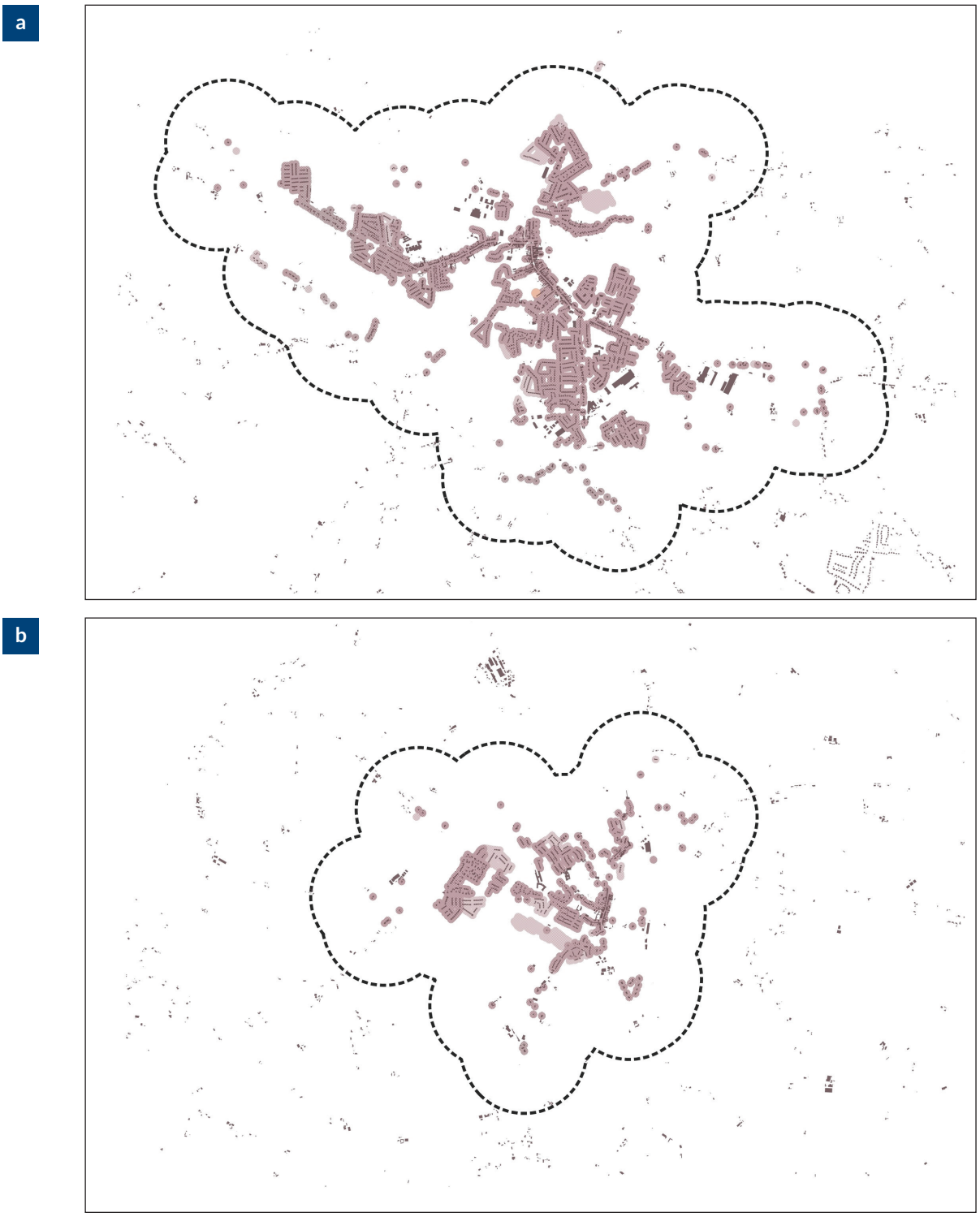

Figure 5. Examples of settlement clusters generated by the compactness assessment method (darker areas represent development pre-2020): (a) Portarlington, a mid-sized town (5,000–9,999) in the Eastern and Midland Region that has exhibited little change in unit density (+0.45 dph) alongside greater fragmentation (0.47 clusters/km^2); (b) Rathdrum, a small settlement (1,500–1,999) approx. 45 km south of Dublin city centre that has registered a significant unit density increase (+2.5 dph) alongside further concentration (−1.13 clusters/km^2).

4.4. Limitations

The proposed method is limited to the measurement of residential units to conform with existing targets and definitions in Irish spatial policy. However, for a more complete picture of morphological compactness, the method could be extended to all building types, depending on available data.

The focus on residential units may also impact results. It is likely, for example, that more significant growth in dwelling construction will be evident in commuter towns within proximity to major centres. That said, while that may bias aggregate figures for individual settlements, it should not determine the degree to which development expresses density or fragmentation characteristics.

For consistency, proximity thresholds are adopted from the CSO "built-up area" methodology of settlement boundary delineation. Different proximity thresholds may, however, provide different results, but are unlikely to influence overall trends.

Finally, it should be emphasised that the method is unable to describe specific patterns of urban expansion but can point to aggregate settlement-scale trends only.

4.5. Results

The greatest increase in unit densities was found in Dublin and the surrounding area. Evidence of this phenomenon is also present in the commuter towns of Cork, to a lesser extent. Much weaker unit density increases took place outside of Dublin and surrounding counties, generally beyond a certain distance from established urban centres. This finding aligns with prior studies on the population growth rates of Irish towns in proximity to larger centres, with adjacency to Dublin being particularly impactful (Cawley, 1991; Lutz, 2001; McCafferty, 2019; Quinn, 1971; Williams & Shiels, 2000). In many cases, it is the densest settlements that are showing the highest rates of unit densification (Figure 6).

Ten settlements showed reduced unit densities: four in the Eastern and Midland Region, five in the Southern Region, and one in the Northern and Western Region. Eight of the 10 towns had populations below 5,000, pointing to size as a factor—there being a lower bar for aggregate unit densities to be negatively altered at this smaller scale.

Fifty-four settlements (27% of the total) show signs of fragmentation: 22 in the Southern Region, 18 in the Northern and Western Region, and 14 in the Eastern and Midland Region (Figure 7). Most towns had a population under 10,000. The distribution of fragmenting settlements does not display a shared locational pattern. Evidence of the highest rates of infill/defragmentation is in settlements adjacent to cities (particularly Dublin, Cork, and Limerick).

Notably, although Waterford recorded the highest percentage population growth of the five cities between 2016 and 2022, it also exhibited negligible alteration in cluster concentration (−0.07 clusters/km^2) and unit density (+0.23 dph).

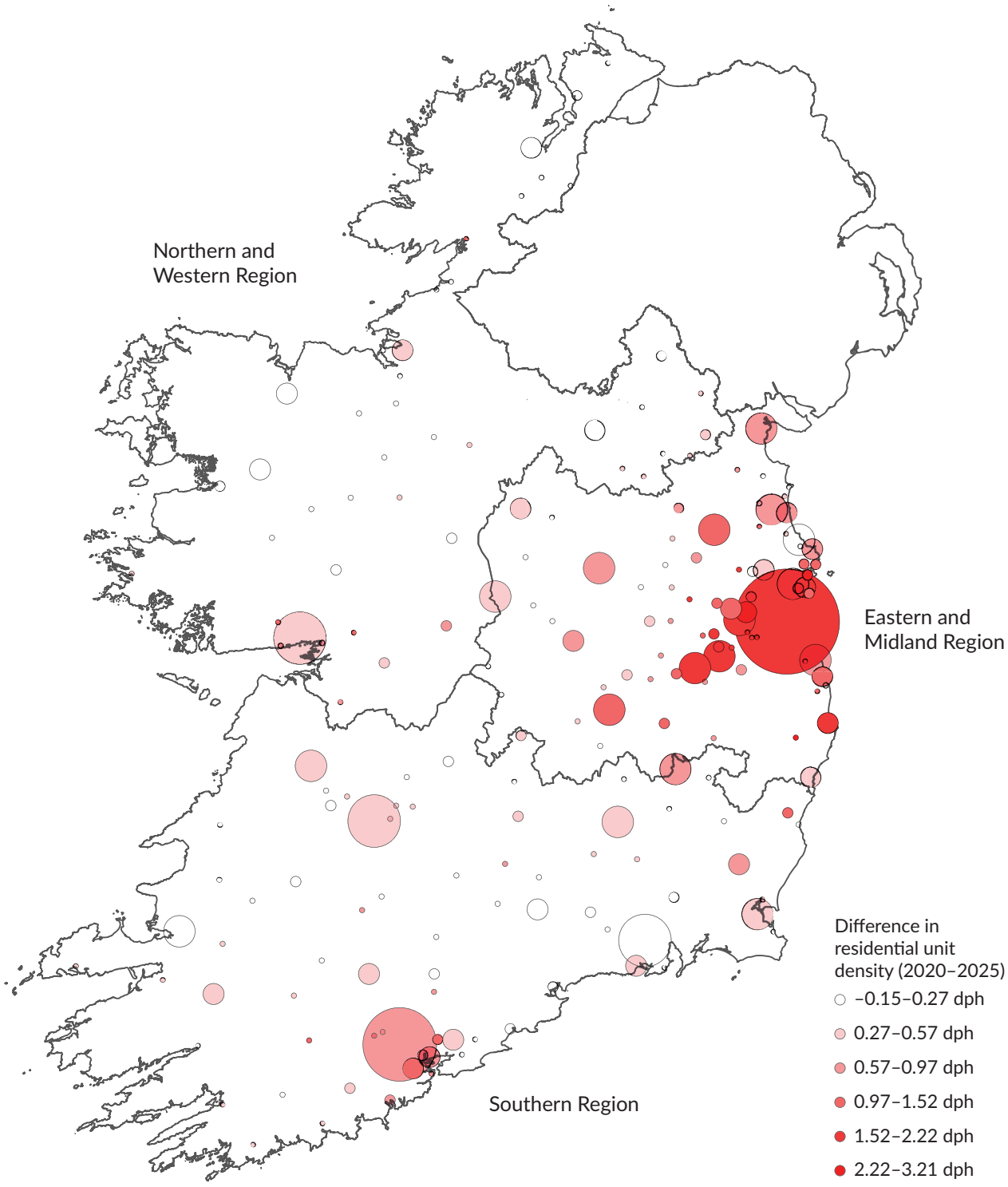

Figure 6. Difference in residential unit density for all urban settlements, 2020–2025. Note: Area of circles represents settlement population size.

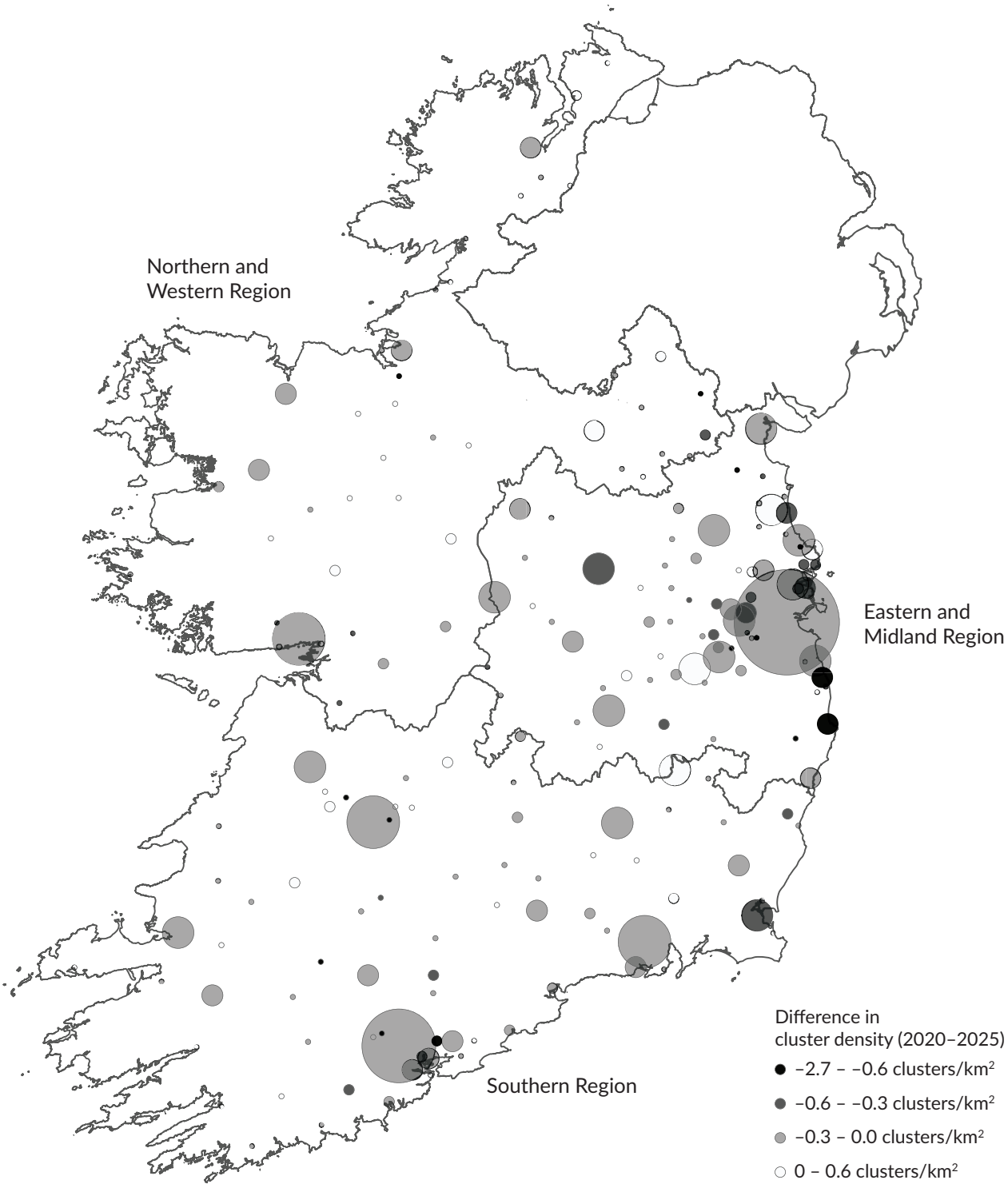

Figure 7. Difference in cluster density for all urban settlements, 2020–2025. Notes: Area of circles represents settlement population size; positive values equate to greater levels of fragmentation.

Lack of significant unit densification or cluster concentration in the Northern and Western Region demonstrates that current dwelling completion location targets, as per NPO 3, can be achieved with little change to the actual residential compactness of existing settlements.

In the Southern Region (with the exception of Carlow town) and Northern and Western Region, settlement fragmentation is accompanied by lower unit densities, implying the spread of one-off housing in the immediate urban periphery (Figure 8).

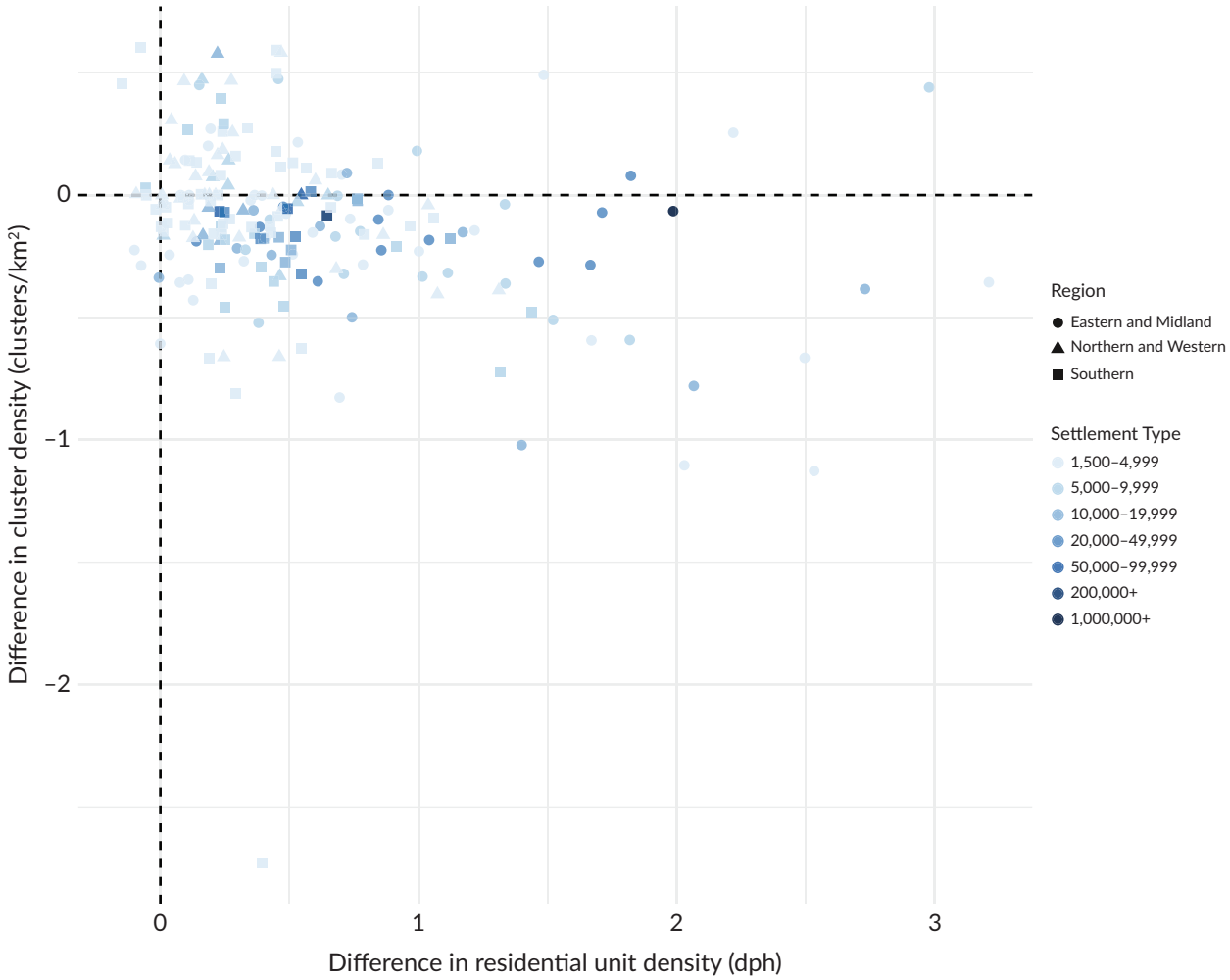

Figure 8. Plot of 200 urban settlements, measuring changes in residential unit density and cluster density, 2020–2025. The majority of settlements display levels of unit densification between 0.0 and 1.0 dph and cluster concentration between −0.5 and 0.0. Location of settlements is shown to have an impact on unit density levels, with all of the 15 settlements above 1.5 dph in the Eastern and Midland Region. Size is shown to be more significant in relation to cluster density, with just five (of 46) settlements in the 10,000+ category displaying evidence of fragmentation.

In general, the results show that compact growth—both densification and concentration—at the settlement-scale has occurred for the majority (66%) of urban areas in Ireland between 2020 and 2025. Individual performance is shaped by settlement size (Table 4), the relevant regional settlement hierarchy (Table 5), and position within the urban system.

Table 4. Compact growth indicators, performance by settlement type.

Settlement type	No.	Median unit density	Median cluster density	% compact growth	% high compact growth
1,000,000+	1	1.99	−0.07	100%	0%
200,000+	1	0.65	−0.08	100%	0%
50,000–99,999	3	0.49	−0.06	100%	0%
20,000–49,999	17	0.61	−0.17	82%	47.1%
10,000–19,999	24	0.47	−0.18	88%	50.0%
5,000–9,999	40	0.45	−0.16	70%	37.5%
1,500–4,999	114	0.27	−0.04	57%	21.2%

Notes: "% compact growth" denotes combined increase in unit density and decrease in fragmentation; "% high compact growth" denotes settlements where both compact growth indicators are above the national median.

Table 5. Compact growth indicators, performance by region.

Region	No.	Median unit density	Median cluster density	% compact growth	% high compact growth
Eastern and Midland	79	0.69	−0.17	73.1%	44.9%
Southern	76	0.34	−0.10	67.1%	23.7%
Northern and Western	45	0.23	0.00	53.3%	13.3%
National	200	0.39	−0.10	66.3%	29.6%

Notes: "% compact growth" denotes combined increase in unit density and decrease in fragmentation; "% high compact growth" denotes settlements where both compact growth indicators are above the national median.

5. Conclusion

In 2025, the first revision to the NPF was published. Despite recommendations to increase the housing location benchmarks set by NPO 3 (Ruane et al., 2023), no changes were made. Nor was there any revision to the population targets in NPO 2. However, as the findings of this article have shown, such national-scale measures are ineffective policy instruments in the implementation of compact growth, regardless of performance thresholds.

This study has demonstrated substantial differences in the percentage of new dwelling completions by region and settlement size. The aggregation of these differences at the national level or across settlement categories can overlook more localised disparities. Similarly, shared population targets for all five cities ignore significant variations in historical and recent growth trends.

Given the data presented, it is clear that a lack of geographic specificity has resulted in national targets that are unable to direct the location or extent of compact growth at scales where it might have meaningful impact—at the settlement level. The results reveal that gaps remain between policy compliance and policy effectiveness.

This aligns with recent research regarding the inability of "one-size-fits-all" approaches in Irish planning policy to acknowledge existing spatial diversity within the country's urban system (Ji et al., 2026)—an issue unlikely to be resolved in light of the continued centralisation of planning powers (Williams & Nedović-Budić, 2023).

A failure to recognise existing settlement patterns is also evident in the NPF's regional population targets (NPO 1). This article has documented the inadequacy of the Northern and Western Region's settlement structure to accommodate its planned population growth. As a result, the majority of new development is taking place outside of urban areas. This dispersed pattern is evident too in the number of towns displaying increased fragmentation. It is reasonable to conclude that regional population targets—established for the purpose of "balanced" growth—are undermining broader compact growth ambitions.

To address this, population distribution figures need to be calculated relative to the existing urban system of each region. These should be assessed relative to existing urban populations, plus the number and size of existing settlements that could accommodate future growth. In addition, differences in dwelling location requirements according to settlement size (towns vs cities) should be removed.

This insight is of particular relevance to international debates on compact growth policies, with the Irish case highlighting the potential disparity between concerns for regional equity and urban containment unless such objectives are measured and managed across a multi-scalar framework that acknowledges the possible direction imposed by existing spatial patterns.

Despite such policy gaps, compact growth is occurring in most settlements. The potential drivers behind these findings remain open to speculation. Though beyond the scope of this study, it is suggested that fragmentation levels could be primarily attributed to land zoning practices and settlement size, while unit densification could be linked to regional housing markets and site-level design. Both aspects point to the need for localised settlement-scale plans to direct growth towards more compact forms. Yet regional and metropolitan planning structures remain weak in Ireland (OECD, 2023; Walsh, 2019), as they have historically (Breathnach, 2013). This is despite the advantages demonstrated by more decentralised governance at these scales in terms of improved compact growth outcomes and greater regional equity (Ahrend et al., 2014; OECD, 2012).

Given the inadequacy of current measures, more direct metrics for compact growth are required (Cahill, 2025). The research presented here is the first attempt to quantify the degree to which Irish settlements have become more or less compact since the adoption of compact growth targets in national spatial policy.

Previous quantitative examinations of physical change in Irish urban development have focused on a single settlement—typically Dublin (see: Hayes, 2021; Horner, 1990; McInerney & Walsh, 2009; Nedović-Budić et al., 2016; Van de Voorde et al., 2011). This is the first study to assess variation in the morphological properties of Irish settlements across multiple regions.

To build on this morphological focus, further research is needed regarding the potential performance of different settlements within the urban system as sustainable locations for future development. An analysis of settlements, classified in terms of their compactness trends, alongside access to public transport, active travel potential, and provision of services could assess whether the Irish interpretation of compactness is producing the sustainability benefits promoted by national policymakers.

Acknowledgments

The author wishes to thank the reviewers for their valuable feedback, the editors for supporting the manuscript, and Dr Alan Mee for his comments and guidance.

Funding

This research was funded by Research Ireland and the Irish Green Building Council (IGBC) through Research Ireland's Enterprise Partnership Scheme (Project ID: ESPG/2024/882).

Conflict of Interests

The author declares no conflict of interests.

Data Availability

The data used to measure the compactness indicators for Irish urban settlements (2020–2025) are available at https://doi.org/10.5281/zenodo.21535831

LLMs Disclosure

ChatGPT was used to check for errors or inconsistencies in spelling and grammar in the preparation of this manuscript.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

References

Ahlfeldt, G., Pietrostefani, E., Schumann, A., & Matsumoto, T. (2018). *Demystifying compact urban growth: Evidence from 300 studies from across the world* (OECD Regional Development Working Papers 2018/03). OECD. https://doi.org/10.1787/bbea8b78-en

Ahrend, R., Gamper, C., & Schumann, A. (2014). *The OECD metropolitan governance survey: A quantitative description of governance structures in large urban agglomerations* (OECD Regional Development Working Papers 2014/04). OECD. https://doi.org/10.1787/5jz43zldh08p-en

Bannon, M. J., & Eustace, J. (1981). *Urbanisation: Problems of growth and decay in Dublin* (NESC Report No. 55). National Economic and Social Council.

Bergin, A., & Garcia-Rodriguez, A. (2020). *Regional demographics and structural housing demand at a county level*. Economic and Social Research Institute. https://doi.org/10.26504/rs111

Brady Shipman Martin. (2000). *The Irish urban system and its dynamics*. Department of the Environment and Local Government.

Breathnach, P. (2013). Regional governance and regional development: Implications of the Action Programme for Effective Local Government. *Administration*, *71*(2), 69–91.

Breheny, M. (1996). Centrists, decentrists and compromisers: Views on the future of urban form. In M. Jenks, E. Burton, & K. Williams (Eds.), *The compact city: A sustainable urban form?* (pp. 13–35). E & FN Spon.

Brown, F. E., de la Barra, T., Rickaby, P. A., Steadman, J. P., & Turner, J. (1998). Sustainability and the city: An evaluation of policy scenarios using an integrated land-use and transport model. *Transactions on the Built Environment*, *33*, 583–597.

Brundtland, G. H. (1987). *Our common future: Report of the World Commission on Environment and Development* (A/42/427). United Nations.

Burton, E. (2002). Measuring urban compactness in UK towns and cities. *Environment and Planning B: Planning and Design*, *29*(2), 219–250. https://doi.org/10.1068/b2713

Büttner, B., Seisenberger, S., McCormick, B., Silva, C., Teixeira, J. F., Papa, E., & Cao, M. (2024). *Mapping of 15-minute city practices: Overview on strategies, policies and implementation in Europe and beyond* (Deliverable 2.8). Driving Urban Transitions Partnership.

Cahill, N. (2025). *Deepening compact growth in Ireland* (Council Report No. 168). National Economic and Social Council.

Cawley, M. (1991). Town population change 1971–1986: Patterns and distributional effects. *Irish Geography*, *24*(2), 106–116.

Central Statistics Office. (2012). *Census 2011: Population classified by area*. Stationery Office.

Central Statistics Office. (2017). *Census 2016 boundary files*. https://www.cso.ie/en/census/census2016reports/census2016boundaryfiles

Central Statistics Office. (2022a). *Population – 2016 – NUTS3* (SAP2016T1T1ANUTS) [Data set]. https://data.cso.ie/table/SAP2016T1T1ANUTS

Central Statistics Office. (2022b). *Population – 2016 – settlements* (SAP2016T1T1ASET) [Data set]. https://data.cso.ie/table/SAP2016T1T1ASET

Central Statistics Office. (2023a). *Census 2022 urban boundaries and built up areas technical paper*. https://www.cso.ie/en/census/census2022/census2022urbanboundariesandbuiltupareas/census2022urbanboundariesandbuiltupareastechnicalpaper

Central Statistics Office. (2023b). *Population – 2022 – NUTS3* (SAP2022T1T1ANUTS) [Data set]. https://data.cso.ie/table/SAP2022T1T1ANUTS

Central Statistics Office. (2023c). *Population – 2022 – settlements (Appendix table 1 Census 2022 de facto population for the 2016 towns)* [Data set]. https://www.cso.ie/en/releasesandpublications/ep/p-cpp1/censusofpopulation2022profile1-populationdistributionandmovements/backgroundnotes

Colin Buchanan & Partners. (1968). *Regional studies in Ireland*. Stationery Office.

Commission of the European Communities. (1990). *Green paper on the urban environment* (COM(90) 218). Office for Official Publications of the European Communities.

de Roo, G. (2000). Environmental planning and the compact city—A Dutch perspective. In G. de Roo & D. Miller (Eds.), *Compact cities and sustainable urban development: A critical assessment of policies and plans from an international perspective* (pp. 31–41). Ashgate.

Department of Economic Planning and Development. (1979). *Programme for National Development, 1978–1981*. Stationery Office.

Department of Environment, Heritage and Local Government. (2009). *Guidelines for planning authorities on sustainable residential development in urban areas*. Stationery Office.

Department of Housing, Local Government and Heritage. (2024). *Sustainable residential development and compact settlements: Guidelines for planning authorities*. Government of Ireland.

Department of Housing, Planning and Local Government. (2018). *Urban development and building heights*. Government of Ireland.

Ding, C., Cao, X., & Næss, P. (2018). Applying gradient boosting decision trees to examine non-linear effects of the built environment on driving distance in Oslo. *Transportation Research Part A: Policy and Practice*, *110*, 107–117. https://doi.org/10.1016/j.tra.2018.02.009

Doyle, A. (2025). The evolution of strategic spatial planning in Ireland: The legacy and ongoing relevance of the European Spatial Development Perspective (ESDP) and the Territorial Agenda of the European Union. *Pleanáil*, *25*, 38–43.

European Environment Agency, & Swiss Federal Office for the Environment. (2016). *Urban sprawl in Europe: Joint EEA-FOEN report*. Publications Office of the European Union. https://data.europa.eu/doi/10.2800/143470

Frey, H. (1999). *Designing the city: Towards a more sustainable urban form*. E & FN Spon.

Frey, H., & Yaneske, P. (2007). *Visions of sustainability: Cities and regions*. Taylor & Francis.

Galster, G., Hanson, R., Ratcliffe, M. R., Wolman, H., Coleman, S., & Freihage, J. (2001). Wrestling sprawl to the ground: Defining and measuring an elusive concept. *Housing Policy Debate*, *12*(4), 681–717. https://doi.org/10.1080/10511482.2001.9521426

GeoDirectory. (2025). *GeoBuilding Intel (Q4 2025)* [Data set]. GeoBuilding Intel.

Goddard, E., Chartier, H., & Ortega, M. (2024). *Climate action guide for urban planners*. C40 Cities.

Government of Ireland. (2002). *National Spatial Strategy for Ireland 2002–2020*. Stationery Office.

Government of Ireland. (2018). *National Planning Framework*.

Government of Ireland. (2024). *Planning and Development Act 2024* (No. 34 of 2024).

Government of Ireland. (2025). *National Planning Framework: First revision*.

Guyadeen, D., & Seasons, M. (2018). Evaluation theory and practice: Comparing program evaluation and evaluation in planning. *Journal of Planning Education and Research*, *38*(1), 98–110. https://doi.org/10.1177/0739456X16675930

Haarstad, H., Kjærås, K., Røe, P. G., & Tveiten, K. (2023). Diversifying the compact city: A renewed agenda for geographical research. *Dialogues in Human Geography*, *13*(1), 5–24. https://doi.org/10.1177/20438206221102949

Hayes, M. K. (2021). Describing sprawl: A configurational analysis of suburban form in the contiguous Dublin metropolitan region. In B. C. Scheer & W. McClure (Eds.), *Cities in the twenty-first century: Proceedings of the XXVII International Seminar on Urban Form*. University of Utah. https://doi.org/10.26051/0D-ZXRW-B3Z7

Hayes, M. K. (2025). The metropolitan gap. *Urban Design*, *176*, 26–28.

Horner, A. (1990). Changes in population and in the extent of the built-up area in Dublin city-region 1936–1988. *Irish Geography*, *23*, 50–55.

Houses of the Oireachtas. (1999). *Financial resolutions, 1999. Budget statement, 1999* (Dáil Éireann debate—Wednesday, 1 Dec 1999; Vol. 512 No. 1). https://www.oireachtas.ie/en/debates/debate/dail/1999-12-01/19

Industrial Development Authority. (1972). *Regional industrial plans 1973–77*.

Jabareen, Y. R. (2006). Sustainable urban forms: Their typologies, models, and concepts. *Journal of Planning Education and Research*, *26*(1), 38–52. https://doi.org/10.1177/0739456X05285119

Jaeger, J. A. G., Bertiller, R., Schwick, C., & Kienast, F. (2010). Suitability criteria for measures of urban sprawl. *Ecological Indicators*, *10*(2), 397–406. https://doi.org/10.1016/j.ecolind.2009.07.007

Jenks, M., Burton, E., & Williams, K. (1996). Compact cities and sustainability: An introduction. In M. Jenks, E. Burton, & K. Williams (Eds.), *The compact city: A sustainable urban form?* (pp. 3–8). E & FN Spon.

Ji, Z., Moore-Cherry, N., & Kogler, D. F. (2026). Challenging narratives of homogeneity: Using PCA and cluster analysis to develop a typology of key towns in Ireland. *Geoforum*, *169*, Article 104510. https://doi.org/10.1016/j.geoforum.2025.104510

Katurić, I. (2025). *Compact cities: Sustainable urban planning and sprawl mitigation—Ex-ante assessment*. European Urban Initiative.

Kayanan, C. M., Moore-Cherry, N., & Tomaney, J. (2025). Metropolitanization, civic capacity and metropolitan governance: Ireland in the metropolitan century. *Territory, Politics, Governance*, *13*(2), 204–220. https://doi.org/10.1080/21622671.2023.2173642

King, L. J., & Golledge, R. G. (1978). *Cities, space, and behavior: The elements of geography*. Prentice-Hall.

Laurian, L., Crawford, J., Day, M., Kouwenhoven, P., Mason, G., Ericksen, N., & Beattie, L. (2010). Evaluating the outcomes of plans: Theory, practice, and methodology. *Environment and Planning B: Planning and Design*, *37*(4), 740–757. https://doi.org/10.1068/b35051

Laurian, L., Day, M., Berke, P., Ericksen, N., Backhurst, M., Crawford, J., & Dixon, J. (2004). Evaluating plan implementation. *Journal of the American Planning Association*, *70*(4), 471–480.

Lennon, M., Scott, M., & Russell, P. (2018). Ireland's new National Planning Framework: (Re)balancing and (re)conceiving planning for the twenty-first century? *Planning Practice & Research*, *33*(5), 491–505. https://doi.org/10.1080/02697459.2018.1531581

Lutz, J. M. (2001). Determinants of population growth in urban centres in the Republic of Ireland. *Urban Studies*, *38*(8), 1329–1340. https://doi.org/10.1080/00420980120061052

MacFeely, S., Moloney, R., & Kenneally, M. (2011). A study of the NUTS 2 administrative regions using input–output analysis. *Journal of the Statistical and Social Inquiry Society of Ireland*, *40*, 60–115.

Mastop, H., & Faludi, A. (1997). Evaluation of strategic plans: The performance principle. *Environment and Planning B: Planning and Design*, *24*(6), 815–832. https://doi.org/10.1068/b240815

McCafferty, D. (2019). Fifty years of urbanisation in Ireland: Structural and spatial evolution of the urban hierarchy since Buchanan. *Administration*, *67*(3), 65–89. https://doi.org/10.2478/admin-2019-0021

McDonald, F. (2006, July 20). Dublin's relentless sprawl leaves planning in tatters. *The Irish Times*, 7.

McInerney, D. O., & Walsh, C. (2009). Spatial distribution of urban land-use change in the Dublin city-region: 1990–2006. *Irish Geography*, *42*(2), 207–223. https://doi.org/10.1080/00750770903112837

Morgenroth, E. (2018). *Prospects for Irish regions and counties: Scenarios and implications*. Economic and Social Research Institute. https://doi.org/10.26504/RS70

Nedović-Budić, Z., Knaap, G. J., Shahumyan, H., Williams, B., & Slaev, A. (2016). Measuring urban form at community scale: Case study of Dublin, Ireland. *Cities*, *55*, 148–164. https://doi.org/10.1016/j.cities.2016.02.014

Neuman, M. (2005). The compact city fallacy. *Journal of Planning Education and Research*, *25*(1), 11–26. https://doi.org/10.1177/0739456X04270466

Newman, J. (1967). *New dimensions in regional planning: A case study of Ireland*. An Foras Forbartha.

O'Brien, T. (2007, August 17). Village on edge of Dublin sprawl copes with rapid expansion. *The Irish Times*, 3.

OECD. (2012). *Compact city policies: A comparative assessment*. https://doi.org/10.1787/9789264167865-en

OECD. (2018). *Rethinking urban sprawl: Moving towards sustainable cities*. https://doi.org/10.1787/9789264189881-en

OECD. (2023). *Towards balanced regional attractiveness in Ireland: Enhancing the delivery of the National Planning Framework* (OECD Regional Development Papers No. 62). https://doi.org/10.1787/3df116ad-en

O'Farrell, P. N. (1974). Regional planning in Ireland—The case for concentration: A reappraisal. *Economic and Social Review*, *5*(4), 499–514.

Office of the Planning Regulator. (2022). *Introducing the planning system: Planning leaflet 1*.

O'Neill, H. B. (1973, September). Regional planning in Ireland: The case for concentration. *Irish Banking Review*, 9–20.

Quinn, R. (1971). The threat of urbanisation in Ireland. *Plan*, *3*(2), 10–13.

Ruane, F., Burke, L., & O'Sullivan, B. (2023). *Report of Expert Group for the First Revision of the National Planning Framework*. Department of Housing, Local Government and Heritage.

Russell, P., & Williams, B. (2021). Irish urban policy: From benign neglect to national strategic planning. In K. Zimmermann & V. Fedeli (Eds.), *A modern guide to national urban policies in Europe* (pp. 58–86). Edward Elgar Publishing. https://doi.org/10.4337/9781839109058.00008

Schneider, A., & Woodcock, C. E. (2008). Compact, dispersed, fragmented, extensive? A comparison of urban growth in twenty-five global cities using remotely sensed data, pattern metrics and census information. *Urban Studies*, *45*(3), 659–692. https://doi.org/10.1177/0042098007087340

Shahab, S., Clinch, J. P., & O'Neill, E. (2019). Impact-based planning evaluation: Advancing normative criteria for policy analysis. *Environment and Planning B: Urban Analytics and City Science*, *46*(3), 534–550. https://doi.org/10.1177/2399808317720446

Siedentop, S., & Fina, S. (2012). Who sprawls most? Exploring the patterns of urban growth across 26 European countries. *Environment and Planning A: Economy and Space*, *44*(11), 2765–2784. https://doi.org/10.1068/a4580

Talen, E. (1997). Success, failure, and conformance: An alternative approach to planning evaluation. *Environment and Planning B: Planning and Design*, *24*(4), 573–587. https://doi.org/10.1068/b240573

Thomas, L., & Cousins, W. (1996). The compact city: A successful, desirable and achievable urban form? In M. Jenks, E. Burton, & K. Williams (Eds.), *The compact city: A sustainable urban form?* (pp. 53–65). E & FN Spon.

Turpin, D. (1967). Physical planning—A review. In F. Rogerson & P. O hUiginn (Eds.), *Pleanáil in Eirinn/Planning in Ireland: The Planning Institute Conference* (pp. 39–42). The Irish Branch of the Town Planning Institute; An Foras Forbartha.

Van de Voorde, T., Jacquet, W., & Canters, F. (2011). Mapping form and function in urban areas: An approach based on urban metrics and continuous impervious surface data. *Landscape and Urban Planning*, *102*(3), 143–155. https://doi.org/10.1016/j.landurbplan.2011.03.017

Walker, G. A. (1987). Two decades of planning—A critical appraisal. In T. A. Boylan & P. J. Drudy (Eds.), *Regional policy and national development* (pp. 14–19). Regional Studies Association.

Walsh, J. A. (2019). Visions and plans for regional development in Ireland. *Administration*, *67*(3), 7–39. https://doi.org/10.2478/admin-2019-0019

Williams, B., & Nedović-Budić, Z. (2023). Transitions of spatial planning in Ireland: Moving from a localised to a strategic national and regional approach. *Planning Practice & Research*, *38*(5), 639–658. https://doi.org/10.1080/02697459.2020.1829843

Williams, B., & Shiels, P. (2000). Acceleration into sprawl: Causes and potential policy responses. *Quarterly Economic Commentary*, 37–73. https://www.esri.ie/system/files/media/file-uploads/2015-07/QEC2000Jun_SA_Williams.pdf

Yemeru, E., Arimah, B., Otieno Otieno, R., van Oostrum, M., Mutinda, M., & Oginga-Martins, J. (2024). *World Cities Report 2024: Cities and climate action*. UN-Habitat.

About the Author

Michael K. Hayes is an architect and PhD candidate at University College Dublin. His doctoral research asks how different morphologies of urban expansion impact the operational energy use of existing settlements. He is a former design fellow in urban design and planning at University College Dublin.