

Connecting the Divided City:

A Space Syntax Analysis of Belfast and Its Policy Implications

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Extended Abstract

This paper examines the spatial logic of segregation and opportunities for urban integration in Belfast through the analytical lens of space syntax, a graph-theory approach, contributing to ongoing debates on divided cities and post-conflict urban policy. Belfast represents one of the most enduring examples of a “divided city,” where ethno-national and religious identities are materially embedded in the built environment. While the roots of division stretch back centuries, the late 20th-century conflict known as the Troubles (1968–1998) intensified spatial segregation, leaving a legacy that continues to shape everyday life, mobility, and socio-economic opportunity. The persistence of peace walls and interface barriers—many of which remain despite policy commitments to remove them—illustrates the deeply entrenched nature of this division.

The study positions itself within a broader theoretical distinction between segregated and divided cities. While segregation refers to the spatial separation of social groups—often linked to inequality and market processes—divided cities are characterised by explicit, politicised, and often institutionalised separation. In such contexts, boundaries are not only socially constructed but physically enforced, producing fragmented urban systems with limited interaction between communities. Belfast exemplifies this condition, where sectarian geographies overlay the urban fabric and shape both movement patterns and perceptions of belonging.

Despite extensive scholarship on the causes and manifestations of segregation, less attention has been paid to the spatial mechanisms that might enable desegregation. This paper addresses this gap by focusing on the configurational properties of Belfast’s street network and their relationship to pedestrian movement, co-presence, and socio-spatial interaction. Drawing on space syntax theory, the research conceptualises the city as a system of interconnected spaces where centrality, accessibility, and visibility influence patterns of movement and encounter. In this framework, urban form is not merely a backdrop but an active agent shaping social relations.

The paper is guided by three central research questions: (i) how spatial centrality and pedestrian movement potential vary between daytime and nighttime conditions across Belfast; (ii) whether increased strategic visibility at peace wall gates can facilitate cross-community interaction; and (iii) how these spatial insights can inform policies aimed at desegregation and social integration.

These questions reflect a shift from viewing division as a static condition toward understanding it as a dynamic, spatially mediated process. Methodologically, the study adopts a mixed-methods approach combining quantitative spatial analysis with qualitative observation. At its core is a space syntax analysis of Belfast’s street network, operationalised through two key measures: Normalised Angular Integration (NAIN), representing to-movement potential (closeness centrality), and Normalised Angular Choice (NACH), representing through-movement potential (betweenness centrality). These measures are calculated at both global (citywide) and local (800m radius) scales, enabling a multi-scalar understanding of urban centrality. Importantly, the analysis distinguishes between daytime and nighttime conditions by modelling the opening and closing of peace wall gates, thereby capturing temporal variations in accessibility.

Complementing this network analysis, visual graph analysis (VGA) is employed to examine intervisibility at key interface locations. Visibility is conceptualised as a critical factor in shaping co-presence, perceived safety, and the likelihood of social interaction. By analysing sightlines and visual permeability at peace wall gates, the study assesses how spatial design influences the potential for “soft encounters” between communities. Statistical analyses of synergy (the relationship between local and global integration) and intelligibility (the relationship between connectivity and global integration) further illuminate the coherence and navigability of the urban system. Finally, a photographic survey provides qualitative insights into micro-scale spatial conditions, grounding the analytical findings in lived urban experience.

The findings reveal a complex and layered spatial structure. At the citywide scale, Belfast exhibits a pattern consistent with a “deformed wheel” structure, characterised by a central hub, radial spokes, and peripheral routes. The historic city centre remains the most integrated and accessible area, attracting high levels of movement and economic activity. However, this centrality is disrupted by infrastructural elements such as inner-city motorways, which both encircle and fragment the core. A key contribution of the study lies in its analysis of temporal variation. When the peace wall gates are open during the day, the network allows for greater permeability and more distributed patterns of movement. In contrast, nighttime closures significantly alter the spatial configuration. The removal of certain routes—many of which are already poorly integrated—results in a paradoxical increase in overall integration values, as the remaining network becomes more centralised around major arterial roads. However, this shift comes at the cost of local accessibility and pedestrian connectivity. Movement is effectively funnelled onto major roads and motorways, increasing car dependency and reinforcing the segregation of residential areas.

This temporal restructuring highlights the role of “authority constraints” in shaping urban mobility, echoing time-geography frameworks that emphasise how institutional rules and controls influence movement through space and time. In Belfast, the nightly closure of gates acts as a regulatory mechanism that restricts cross-community movement and reinforces spatial division, even in the absence of overt conflict. At the neighbourhood scale, the analysis of interface areas such as Alexandra Park and Bryson Street reveals the importance of visibility and spatial design in mediating interaction. Higher levels of visual integration at peace wall gates are associated with greater potential for co-presence, suggesting that design interventions that enhance intervisibility could facilitate more frequent and less fraught encounters between communities. Conversely, visual asymmetry—where one side of a boundary has greater visibility or control than the other—can reinforce perceptions of territorial dominance and inhibit interaction.

From a policy perspective, the research offers several important implications. First, it highlights the limitations of approaches that focus solely on removing physical barriers without considering the underlying spatial logic of the urban system. Simply dismantling peace walls may not lead to integration if the surrounding street network remains poorly connected or if visibility and accessibility are not addressed. Second, the study suggests that incremental, design-based interventions—such as improving sightlines, enhancing gate permeability, and integrating local streets into wider movement networks—can play a significant role in fostering everyday interaction. Third, the temporal dimension of accessibility should be a key consideration in policy-making, as nighttime restrictions have a disproportionate impact on mobility and social mixing.

More broadly, the paper contributes to theoretical debates by demonstrating the value of space syntax as a tool for understanding segregation as a spatial phenomenon. It responds to critiques that traditional measures of segregation, often based on residential data, fail to capture the dynamic and relational nature of urban life. By focusing on movement, visibility, and co-presence, the study provides a more nuanced account of how division is produced and potentially mitigated in everyday urban contexts.

In conclusion, Belfast's divided landscape is not only a product of historical conflict but also of ongoing spatial practices and configurations. The persistence of segregation is reinforced by the structure of the street network, the management of interfaces, and the temporal regulation of movement. However, these same spatial mechanisms also offer pathways toward integration. By reconfiguring urban space to enhance connectivity, visibility, and co-presence, one can create conditions that support more inclusive and cohesive urban environments. The insights generated by this study are not only relevant to Belfast but also to other divided cities seeking to move beyond entrenched patterns of separation toward more integrated futures.