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# Addressing urban social and spatial stratification: testing the potential for integration of public housing

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## Abstract

The legacy of public housing in the American city is dominated by a condition of social and spatial stratification. In New York City, inadequate funding exacerbates the conditions of isolated public housing residents, raising questions about the stability and sustainability of public housing. At a time when a severe housing crisis is impacting on the affordability of and access to urban housing generally, addressing this legacy of public housing can be the impetus for a long-term vision that integrates public housing into the fabric of the city, providing new housing options for public housing residents while merging them into mixed-income neighbourhoods with redefined public spaces and increased services and amenities. This approach to a long-term vision, built around high-density mid-rise development, contrasts with the incremental approach currently expedient due to the social and political climate surrounding public housing. However, current resistance to an aggressive strategy belies another part of the legacy of public housing: the major

demolition of city streets and blocks that made possible the anti-urban planning that undergirds this isolation and stratification. Empirical evidence supports urban design that builds on the nineteenth-century city's urban form of small blocks and active streets as the foundation for vital urban neighbourhoods. This study of the political and urban design efforts to address the severe challenges facing public housing tests the potential for a path, when the political and social climate allows, for an aggressive strategy to preserve public housing that centres on social and spatial integration.

**Keywords** urban morphology; urban design; urban housing; urban infill; affordable housing; public housing; public space

## Introduction

Cities around the globe contend with the challenge of meeting the high demand for new housing, especially affordable housing,[1] and integrating and distributing this housing as one means of preventing the social and economic stratification of urban populations.[2] New York City's housing availability, as one example, was deemed the worst in 50 years in the latest report in 2024.[3] This housing demand increases pressure on urban land, especially on sites with a lower density that have long-term sustainable potential, including access to public transport.[4] The 'City of yes' proposal by New York City Mayor Adams seeks to increase housing supply across the city.[5] At the same time, many residents in cities like New York are resistant to integrating new housing, especially at higher densities and at affordable rates.[6] Furthermore, advocates for social justice argue that low-income minority communities are frequent targets for increasing development rights that, while providing additional affordable housing along with new market-rate units, inevitably lead to gentrification and the displacement of existing residents.[7] Enhanced strategies are required to supply communities with the tools for evaluating the potential for symbiotic development, defined here to mean new development that supports existing urban communities' needs without displacement, offering new housing, including affordable housing, along with opportunities to improve health and connectivity and build bridges between diverse populations. Investigations of this approach to urban morphology can offer existing residents examples of urban development interventions that can be critiqued and evaluated for their potential for neighbourhood improvement, where new and old fabric are woven together around an improved public realm with stronger connectivity to the surrounding communities.

To explore these issues, this article reviews the debate in New York City around proposals to build new housing on public housing estates that sheds light on the tension between social justice/equity and housing demand and provides an exploration of an integrative development approach that seeks to address the broad range of urban spatial challenges of superblock housing campuses. This study looks in particular at the tower-in-the-park campus that effectively separates communities and facilitates stratification across racial and economic lines. The approach to this study applies urban design principles rooted in Jane Jacob's analysis of urban form, seeking opportunities for place-making that leverage and respect existing fabric alongside the integration of new mixed-use housing, thus building new possibilities for supporting and connecting diverse urban communities.

## Public housing in New York and its legacy of disruption of urban form

As of 2023 the New York City Housing Authority (NYCHA) provided housing for 360,970 residents, a number greater than the population of mid-size cities like Pittsburgh. This population is distributed across 335 sites, with an inventory of 177,569 units in 2,411 buildings. The NYCHA has an ageing building inventory, where 82 per cent of the structures are 40–89 years old, and 97 per cent are at least 30 years old.[8] The campuses were largely planned on the 'tower in the park' model, utilising superblocks that can be characterised as a specialised urban design that stands apart from the typical fabric and


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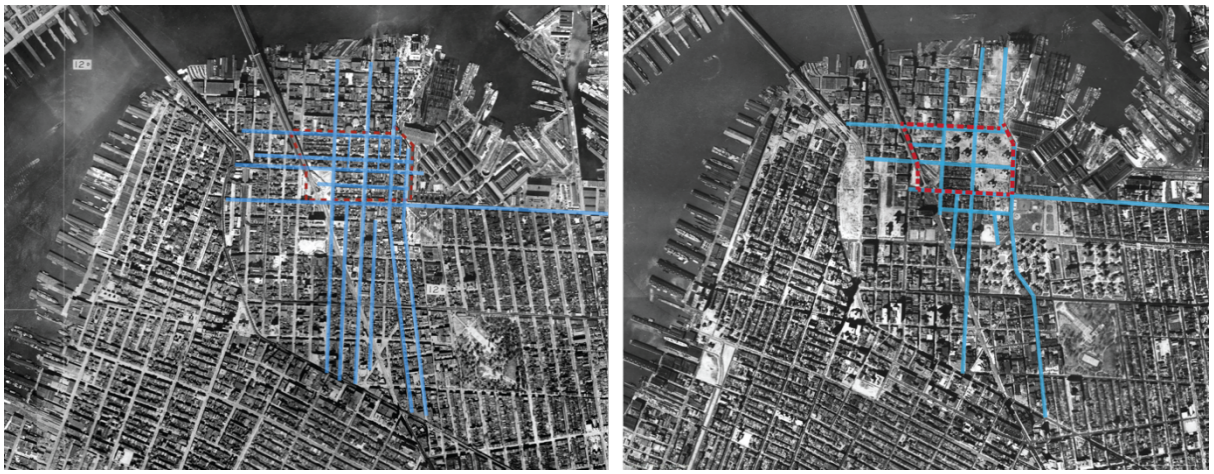
its street/block pattern. The development of this public housing occurred at the moment New York reached urban maturity after rapid growth in the nineteenth century. Interpreting their actions, the planners of public housing campuses viewed this mature city as already outdated. The campuses we see today suggest that the planners envisioned a next-generation city transformation where horizontal density and well-defined streets would be reconfigured into vertical density with open space crossed by access roads. This vision for the new city justified the expansive demolition of entire nineteenth- and early-twentieth-century neighbourhoods, eliminating dense low-rise blocks and well-defined streets, thereby displacing the population and sacrificing businesses as well as social capital in the process.

This large-scale demolition and reconfiguration had a critical impact on the continuity and connectivity of the urban structure of neighbourhoods across the city. For example, in 1924 downtown Brooklyn exhibited a clear and continuous urban structure of small blocks and a strong street network that allowed easy and flexible movement in all directions. This continuity and urban block structure was sacrificed in the mid-twentieth century to make superblocks for public housing development, as well as by the expressways that soon followed (Figure 1). The sacrifice of the robust block and street structure not only impacted the connectivity of large areas of urban land, it also robbed this land of cultural and monetary value that is now widely recognised and acknowledged by preservation efforts and property values. In the case of downtown Brooklyn, Brooklyn Heights and Vinegar Hill serve as two of many examples of neighbourhoods with high levels of cultural and economic value as well as social capital rooted in the preserved fabric, small-scale blocks and a largely intact street network.[9]

**Figure 1. Diagrams of the street network at the site of the Farragut Houses before demolition in 1924 (left) and after demolition in 1951 (right). Diagrams made using New York City historic aerial photos**



## Infill as an approach to addressing the public housing crisis

Public housing in New York is a relative success story socially compared to many of its contemporaries in other American cities,[10] yet the fate of New York's public housing is now in doubt. The ageing housing stock is falling into significant disrepair that harks back to the conditions of substandard infrastructure and unhealthy living environments that public housing was intended to permanently eliminate.[11] This condition is rooted in mismanagement and in the disinvestment in public housing by the federal government, combined with the state and city failing to allocate adequate new funding to make up the shortfall. As the scale of the crisis emerged in the first decade of the twenty-first century, the city began to consider strategies to generate new revenue streams that could contribute funding for the repair and upkeep of the housing. Among the emerging strategies was a programme informally called 'Infill'.[12] There have been three iterations of this programme proposed by successive city leaders: the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Bloomberg Infill programme, the DeBlasio Build to Preserve programme and, most recently, the city council speaker's Fair Housing/New Model for NYCHA.[13]

A central premise of all of these programmes is that the tower-in-the-park public housing campuses across the city offer an opportunity through their significant unbuilt land area. This land can be used for new development that generates income that can be put towards the repair and maintenance of each of the campus's existing buildings.[14] The Bloomberg and DeBlasio programmes were slight variations on one other, with each relying on generating new income through land leasing for infill development. In addition to the benefit of income through these leases, the infill development would also provide new affordable housing stock in combination with market-rate housing, with the latter subsidising the former. The DeBlasio plan, for example, required a ratio of 70 per cent market rate to 30 per cent affordable units.[15]

The latest proposal, presented by Adrienne Adams, the New York City Council Speaker, was included in her State of the City Report in March 2023. The proposal, described as a potential pilot programme, was sketched broadly, with many details yet to be filled in. Here, the approach to addressing the critical needs of NYCHA housing shifts in two significant ways. First, this proposal judges the renovation of existing buildings that have fallen into significant disrepair as inadequate with regard to contemporary housing standards and expectations. The proposal calls for replacing deteriorated NYCHA buildings with new structures, relying on the merging of all 'existing city, state, and federal financing tools'.[16] Second, this proposal includes the mixing of public housing units with affordable and mixed-income units in the same building. In addition, the proposal explicitly acknowledges and seeks to address the long-standing condition of a lack of mixed-use facilities within NYCHA campuses. The open spaces on campuses would be impacted by this approach, but how this would work is a bit ambiguous as the proposal mentions a participatory design process for open spaces driven by the tenants.

## Critiques of the infill programme

Despite the intention to implement a similar programme for over a decade, the effort to address the critical needs of public housing in New York City has stalled because it has always been – and continues to be – mired in controversy. The local press has published dozens of articles that question the motivations of using new development as a central approach to solving this crisis.[17] Community board correspondence and resolutions document a contentious process for implementing the programme, with the mayor's office at odds with community boards and other local and state officials.[18] At the centre of the controversy are the residents who feel woefully neglected, first by the deterioration of their buildings and now by the city failing to meaningfully engage them in the conversation and process of how their communities will change through this infill programme.[19] There are a range of criticisms of the infill strategy by the residents, public officials and housing advocates. While some denunciations focus on physical impacts, including the reduction of natural light and ventilation in the apartments, accompanied by the loss of playgrounds, parking and open spaces, the overwhelming objection is the lack of consultation and involvement of residents in the process.[20] The residents feel unprotected in the face of the powerful forces of City Hall and the New York development community. All of this results in a sense of mistrust of the whole process and the stated goals for the infill projects. Some residents express a concern that infill projects are the beginning of the privatisation of the NYCHA, and will result in the gentrification of their community and their eventual displacement. The poorly designed and executed process, along with inadequate communication by the city and the development community's leadership, feed the controversial climate surrounding the programme.[21]

## Pilot projects

The controversy over the Bloomberg infill strategy halted its implementation before any projects broke ground. The DeBlasio administration formally relaunched the programme in 2018, with the mayor's office hoping for a new beginning, with better communication and an explanation of the need for this strategy.[22] As part of the relaunch, a number of NYCHA campuses were identified for pilot projects that could demonstrate the viability of the infill concept. A few of these projects, two of which are shown in Figure 2, proceeded to the detailed design stage. In some cases, the projects could be characterised as logical and contributing to a better urban condition. In Brooklyn, a smaller-scale campus, Wyckoff


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Gardens, was modified by erecting new buildings on existing parking lots. The proposed mix-income buildings respond to the scale of the public housing towers and virtuously build out the corner conditions of the block, providing street wall definition and active fronts at the pavement level, bringing the campus into a closer relationship with the fabric of the adjacent blocks in the neighbourhood.[23] This pilot project provided a clear example of new construction on NYCHA properties where the benefits could be demonstrated to both the residents (income to fund building renovations, new services and amenities on the block) and the neighbourhood and city (stronger integration of the NYCHA fabric, increased street definition, potential for safer streets and new affordable housing units).

**Figure 2. Proposed infill projects at Wyckoff Gardens, Brooklyn (left) and Holmes Towers, Manhattan (right)**

In contrast to the Wyckoff Gardens project, the pilot project at the Holmes Towers in Manhattan precisely exemplifies the concerns and scepticism of tenants and advocates, amplifying the controversy facing the infill strategy. This project awkwardly squeezes into the site a new tower that has twice the number of stories as the adjacent public housing towers.[24] This proposal, which was eventually withdrawn, seemed to be little concerned with its context and felt more like a clear illustration of the unwanted imposition that the residents articulated in their critiques. Other pilot project proposals did little to dispel the controversy as they graphically communicated that most of the changes in the local environment would most likely be to the benefit of the newcomers and the developer rather than the existing residents.[25] In essence, many of the design proposals circulating did not present redevelopment approaches that existing residents could believe would safeguard their community and improve their lives.

## Recent projects

Despite the long-running scepticism and abandoned projects, the use of underused NYCHA land has moved forward, in this case to the development of new affordable housing units. A NYCHA/US Department of Housing and Urban Development (HUD) report cites 18 transactions since 2015, providing 2,623 affordable units built or under construction.[26] This programme, initiated by the Next Generation NYCHA programme in 2015, proposed using NYCHA land to provide sights for a total of 10,000 new affordable housing units. These new buildings, usually isolated infill buildings, often on a corner of the larger campus, provide new affordable housing and new services and amenities for the existing public housing residents.

Mill Brook Terrace in the Bronx offers a case study of the friction and resistance in the early stages of these projects and provides an opportunity to study outcomes after execution. In 2016, a local paper documented the Mill Brook Houses community responding to a New Generation NYCHA project that would lease land on the campus to a non-profit developer for new senior housing as well as amenities that would serve the larger residential population. A 2016 article in the *Mott Haven Herald* documents


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clear opposition to the project from residents, even though the basis of the project was a community consensus on the need for more senior housing and services. The journalist captured a sentiment that has dogged infill projects in describing how 'residents expressed their anger at the plans for a glittering new complex while they continue to live in housing that a representative for City Council Speaker Melissa Mark-Viverito said was nightmarish'.[27] At the core of the resistance to the project was the sense of mistreatment and betrayal, where residents noted that if they were late with their rent payments they would face court action, even though the authority had failed to address critical repairs to the buildings needed to meet basic living standards.

This project moved ahead in the face of community resistance, with construction completed in 2019. A 2022 article in the *Bronx Times* documents the formal ribbon cutting of the fully leased building, with the mayor, borough president and city council members all extolling the virtues and success of the project.[28] The benefits included generating US$2million of income, presumably mostly through the land lease to fund much-needed repairs to the existing Mill Brook Houses. Similar projects had been executed at the Ingersoll and Sumner Houses in Brooklyn. The Mill Brook Terrace example provides a stark contrast between the community response to the initial proposal and the post-construction apparent success of the new development, judged by the 100 per cent occupancy of the new affordable units and the provision of the promised amenities as well as income for repairs. Also noted in the post-construction discussion is the improvement of the street quality with a more friendly, walkable frontage at an important intersection.

A major project in current planning is the replacement of the Fulton and Elliot-Chelsea Houses in the Chelsea neighbourhood of Manhattan. In June 2023, the NYCHA announced that the existing campuses would be fully demolished and replaced by new construction, emphasising an 'unprecedented resident engagement effort'.[29] The plan described in the press release included replacing the 2,055 existing apartments and adding 3,500 new mixed-income apartments, with 875 units designated as affordable. This new total of 5,555 units would be developed within the existing land area of the campuses, raising the average population density across these campuses from 327 people per acre to 901.[30] The engagement process was presented by the NYCHA as a new example of working with the residents and building a plan around a consensus. In this case, a major component of the engagement process was a survey that asked NYCHA residents to choose between complete demolition or redevelopment of their housing or rehabilitation of their existing buildings. Reporting on this process suggests that many residents did not participate in the survey.[31] Recent reporting suggests that, while the engagement process did help garner support for redevelopment, it was perhaps not as successful an engagement process as the NYCHA reports. This points to the continued need to refine the process so that can it can support the best possible outcomes for existing residents while at the same time responding to the general housing crisis.

## New perspectives on the infill strategy

Prominent non-profit research organisations are publishing reports outlining a way forward that addresses the residents' and advocates' critiques to build new support for the infill strategy. The most poignant of these, the *Public Housing Revolution* by the Citizens Housing Planning Council (CHPC), looks for successful strategies in other cities. It reports on the process adopted in the UK to address similar issues facing council housing,[32] noting the key principles adopted:

- the establishment of the Decent Home Standard[33]
- the recognition that public housing residents possess expertise on their housing that must be brought to bear on any solutions, in combination with impartial expertise and resources on affordable housing development
- the presentation of a menu of different options that provides residents with perspective to make choices to reach the goal of decent housing for all residents.

The examples from the UK are particularly compelling.[34] These projects demonstrated the attractiveness to residents of not only rehabilitating their existing housing but also being given options that included redefining the campus or estate as an urban place that connected to the surrounding streets and block structures with shared public spaces and community facilities. In these projects, the residents embraced a


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new mixed-income culture as a necessity for helping to pay for the projects, even negotiating to increase the number of market-rate units in exchange for an additional bedroom in the programming of their new subsidised units to replace their existing ones.

Another report focused on the NYCHA crisis. *Time to Act*, by the Regional Plan Association, is a 10-point plan that includes support for building the next generation of public housing: new units to either replace existing buildings altogether or facilitate full renovation of the existing buildings.[35] This recommendation notes that this process may also consider larger-scale redevelopment of NYCHA campuses. Both reports are predicated on full rights for existing residents to remain in public housing, precluding displacement. In this report, Seattle is noted for models of successful redevelopment. In particular, a neighbourhood called High Point,[36] whose phased demolition and redevelopment followed similar strategies to the English projects, sought to diversify the population from low-income to mixed-income in a walkable, well-connected neighbourhood with shared public spaces and community facilities.

## New models for public housing interventions

The examples noted in these reports demonstrate the advantages of a master planning process that applies principles of small blocks and a rich street network with public spaces located at the interface between public housing and the surrounding neighbourhood fabric. These examples are not just about urban morphology and structure; they are a response to the growing literature and experience of city planners who recognise the impacts of these strategies on health outcomes, happiness and human connectivity.[37] These include principles that are antithetical to the mid-twentieth-century planning of NYCHA estates; that is, making complete communities that are interconnected, walkable, exhibit complexity and variety, and are convivial, encouraging diverse activities and uses that help neighbourhoods become more sustainable and resilient. ARUP's *Cities Alive* report diagrams the interrelation between the many benefits of walkable neighbourhoods, including car-free initiatives, pedestrian safety, pop-up and tactical urban interventions, road diet, traffic calming, innovation of public space and integration of greenways and blueways.[38] To this end, Howard Husock of the Manhattan Institute proposes 're-streeting' public housing campuses, reconnecting them to the surrounding neighbourhoods to accomplish many of these critical goals.[39]

## Reframing the infill programme

Reframing the infill programme more broadly – as a critical repair to the urban structure that can combine the goals of raising the living standards of public housing residents and increasing the city's housing supply – could be the path with the most potential for a sustainable and resilient long-term solution to both the public housing crisis and the broader affordable housing crisis. With the continuing controversy, fuelled by an inadequate engagement process, hindering solutions that could more broadly address the needs of the public housing residents, adopting some combination of the lessons and recommendations discussed in these reports has some merit that will help break the impasse. Building trust between officials and residents with meaningful engagement in the decision-making process is the first step. A foundation of trust can be reinforced by forming a decision-making team of NYCHA residents and impartial professionals, along with city officials from agencies that oversee affordable housing in the city. This team can work together to develop a critical menu of options for each campus. This may include, after discussion and reflection by the team, the larger reconfiguration of the campus, with the cost-benefit analysis of increased connectivity with the adjacent neighbourhoods and the re-establishment of a walkable street network and small blocks for the decision team to consider.

## Urban place-making opportunity

The reframing of the infill programme is an opportunity to assert that any solution to the existential questions for public housing in New York City will have to contend with critical decisions regarding the existing isolation of the fabric of the campuses. While demolition, as proposed by the current city council speaker, would allow for the most fundamental remaking of these campuses, this would sacrifice the embedded carbon, economic and social investment in this fabric. With the possibility that existing residents could elect to maintain their housing units, it is important to test how larger urban goals for


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reintegration could be achieved by working with the existing fabric. Academic studies reveal that an idiosyncratic urbanism could emerge that would allow for place-making through the formation of new public and private spaces serving existing and new residents. This emergent urban form's flexibility gives it the potential to reconnect the NYCHA territory fully into the spatial patterns and network of the streets in the adjacent neighbourhoods.[40]

# A case study demonstrating the potential of an expanded approach

The current social and political climate leaves the city seeking mostly incremental steps towards the larger goals of putting public housing on a path towards stability, sustainability and resilience. Academic studies like this, however, can push the discussion forward by exploring more comprehensive integrative strategies, seeking a future for public housing that is fully integrated into the city's fabric and eliminating the social and economic isolation of the existing campuses. The Farragut Houses campus near downtown Brooklyn offers an opportunity to test this comprehensive approach to the infill strategy that emphasises social and economic integration, walkability, health and connectivity.

## Initial urbanisation of the territory

The site of the Farragut campus is approximately 18.7 acres, including the street area.[41] A 1916 fire insurance atlas, shown in Figure 3, documents 16 blocks divided by eight streets and lanes within this area.[42]

The atlas indicates that approximately one-third of the buildings within this area were built of brick, while the remainder were constructed of timber. Most of the brick structures were built in the 1850s or thereafter. With the urbanisation of this area starting around 1820, some of the structures in this area may have been as old as 120 years when the city was surveying the area for blight. This atlas depicts approximately 431 lots in the campus area. It is interesting to note that, with one or two exceptions, every lot was built out, demonstrating the viability of this urban neighbourhood in the late nineteenth and early twentieth centuries. While the atlas does not show all the businesses across the pre-NYCHA development area, the evidence from the atlas, combined with historic photos, suggests a number of businesses and at least one church within these 18.7 acres.[43] Using the power of the city government, officials justified the large-scale demolition of everything described above to make way for the Farragut Houses. Along with the loss of over 400 buildings across the site, an approximate measurement shows a total loss of 3,408 linear feet of existing streets, lanes and alleys (Figure 3).

## Superblock conditions

The existing NYCHA campus, shown in the diagram in Figure 4, was developed on the territory where this rich urban fabric was demolished. The campus consists of three superblocks and ten concentric towers. The superblocks are served by access roads and pedestrian paths rather than streets, with no building frontage or definition typical of a Brooklyn street and sparse pedestrian activity across the campus. Commercial uses are excluded from the campus, while much of the semi-public open space between towers is largely unused, off limits to both residents and non-residents.[44] While advocates for public housing often tout the value of open spaces on a campus such as the Farragut Houses, the tension between preservation and redevelopment is rooted in the nature of this space; it is this urban condition that results in the isolation and pejorative distinction of this public housing campus. In addition to the inherent isolation of a superblock tower-in-the-park development, many sites selected for public housing also have challenging adjacencies that further isolate the public housing population. This is the case at the Farragut Houses where more fabric around the site was demolished to make way for the Brooklyn Queens Expressway and the interchange ramps on and off the Manhattan Bridge immediately to the west of the site. Furthering the isolation of these residents is the Navy Yard to the east. The Navy Yard daytime population and use are growing, but this unique place in Brooklyn is a walled and gated territory, leaving the Farragut site with further reduced connectivity.


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**Figure 3. A portion of the 1916 fire atlas shows the Farragut campus land area, indicated with a dashed line (Source: New York Public Library Digital Collections)**


## Spatial nature of the territory

The initial nineteenth-century urbanisation of this territory of Brooklyn produced a network of public connectivity through its dense street pattern that, today, can be understood as critical to the daily functionality of urban life. Urban scholars, most notably Jane Jacobs, researching twentieth-century American cities, revealed the deeply important role streets play in cities and their urban neighbourhoods. Not only are streets the fundamental spatial condition that allows unfettered access and movement through the city, they also have rich place qualities that support social and economic functionality. Jacobs contends that streets are essential components of cities, mitigating and supporting the daily contact and interaction of strangers in urban neighbourhoods.[45] The re-establishment of streets that connect with the surrounding urban neighbourhoods sets up the condition for the same type of active street life found in most Brooklyn neighbourhoods (Figure 5), laying the foundation for stronger social


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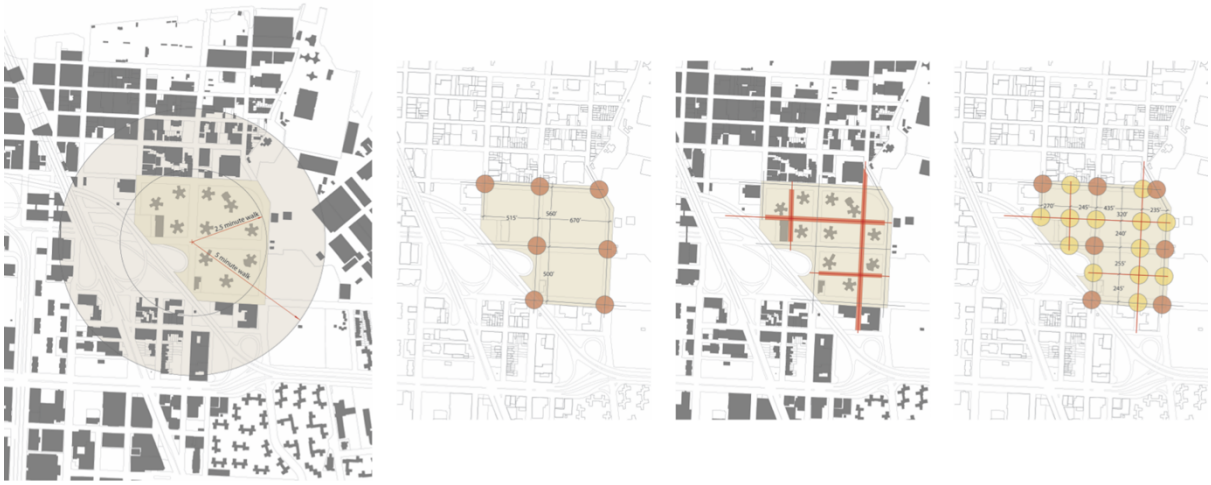
connectivity and bonding between the public housing residents and their neighbours beyond the edge of the superblock. Central to the re-establishment of active streets is the clarification of public and private space across the territory. The half-century failed experiment with ambiguous semi-public spaces verifies that Jacobs' principle of clearly defining the boundaries of public and private space is indeed an essential quality that allows streets to provide the sense of safety necessary for public interaction with strangers.[46] The NYCHA confirmed this conclusion in the Connecting Community design guidelines published in 2020, specifically promoting Jacobs' theory of eyes on the streets as essential for safety.[47]

**Figure 4. Diagram of the existing spatial condition of Farragut Houses**

**Figure 5. Analysis of Farragut Houses' potential for walkability and connectivity**

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Maintaining appropriate open space is a critical issue for both existing residents and public housing advocates. It is not clear, however, that a strategy that merely reworks details of the existing semi-public open space will prove to fundamentally address the social isolation and spatial dysfunction of an NYCHA campus like Farragut. The reallocation of open spaces, therefore, must seek to improve the accessibility, use and environmental and social impact of the open space around public housing. As active streets are the most fundamental open spaces of a city, reintroducing a rich network of streets converts dysfunctional open spaces into highly functional spaces. In addition, parks and squares tied into the network of active streets are nurtured by their public access and position relative to commercial activity, increasing their potential use and vitality by all members of the community. An infill strategy following this logic, illustrated in Figure 6, has strong potential to transform the environment around the existing towers. Connectivity can be restored and walkable active streets and public parks and squares can emerge, which can host and support the daily interaction of strangers.

**Figure 6. Diagram of infill development forming streets and public squares in coordination with existing towers**

## Fabric of the territory

The current infill strategy is slowly working towards supplying a revenue stream for the repair and maintenance of NYCHA housing but social and political realities limit what this strategy can achieve regarding larger-scale transformations of the housing campuses.[48] The transformation of semi-public open spaces to active streets requires mixed-use housing fabric to define the streets. This strategy significantly increases the revenue stream opportunity, albeit requiring significantly higher density and land coverage. For example, the goal of transforming open space to re-establish the street network on a campus like Farragut, shown in Figures 4 and 6, requires a more substantial integration of new fabric to achieve the spatial qualities required for the clear definition of public space and to facilitate active street life.


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To this end, this case study integrates new fabric as needed for the goal of redefining the public and private open space of the territory. Assuming the retention and full repair and upgrading of the ten towers on the site, new fabric is introduced across the territory. Taking a maximalist approach, the case study provides approximately 1,840 additional units and 306,000 square feet of mixed-use space.[49] Using a ratio of two people per unit, the existing population of 2,962 residents would increase to 6,510. This is a substantial increase in population density, from 178 people per acre to 268.[50] On the one hand, while this population density greatly exceeds the average New York City population density of 45.8, it is similar to the population of a number of census tracks on the Upper East Side of Manhattan, four of which, for example, exceed this density, ranging from 295.8 to 449 people per acre.[51] On the other, the new population density in this study of the Farragut campus is significantly lower than the proposed density of 901 people per acre at the Fulton and Elliot-Chelsea Houses in Manhattan.[52] The case study's increase in population at the Farragut site can be judged as a reasonable increase to achieve the benefits of improved spatial conditions. This increase in units can also be judged as a reasonable opportunity for this site to contribute to the city's efforts to increase the overall housing supply by hundreds of thousands of units.[53] Sites like this are especially attractive for increased density as they are deemed transit-oriented, with access to a subway stop within a 0.6-mile radius. This particular territory, as previously mentioned, is also isolated due to the bridge and expressway infrastructure on the west and the gated Navy Yard to the east. This contextual condition further supports a strategy centred on a compact urban form, with a higher population density to generate activity on the streets and adequately patronise the commercial spaces that would enhance the available services and amenities for the public housing residents.

It is important to note that this study of housing density does not use current zoning to test the density. Instead, it seeks to explore the judgement of appropriate density with regard to hierarchy and spatial definition. This approach makes sense in the context of the recommendations of the Rand Corporation report, stressing the importance of relaxing zoning limits on housing density within a 0.6-mile radius of a subway or commuter rail stop.[54] The density in this study is achieved with the addition of 21 new buildings that average 7.43 stories. The tallest new building in this study is 17 stories, placed to avoid casting shadows on any of the existing NYCHA towers. As the NYCHA towers on this campus are typically 14 stories, this approach to the new fabric intentionally maintains the NYCHA towers' dominant presence across the neighbourhood.

## Unique urban form

With the latest thinking presented by the council speaker, including the possibility of moving NYCHA residents out of dilapidated buildings and demolishing them, this study proceeds with the principle of maintaining the Farragut towers based on their embedded carbon and assumed structural viability. This approach then offers the testing of a unique urban form with infill fabric defining new streets and public spaces that are more nuanced and complex in their geometry and alignments. The composition of new streets and squares in this study begins with resetting the relationship of the Farragut towers with the public realm, with all building entrances directly off the sidewalk. This places the towers in a more normative condition to the street, increasing safety with greater visibility of the lobbies and eliminating awkward semi-public zones of space at all the entrances. In addition, many lobbies could be enlarged to provide a new gracious presence on the street front.

In this study, the primary public square is defined by two of the ten NYCHA towers, with additional new fabric buildings defining the other edges of the space. This intentional hierarchy was intended to place a portion of the existing residents at the public heart of the neighbourhood, representing the larger NYCHA community at the interface between new and existing residents. In addition to the central public square, a new public square was developed in front of the existing PS307 school, raising the public presence of the school, defining a safe pedestrian space for the dropping-off and picking-up of students and a space where special events could take place celebrating the students and families and the larger community. The existing basketball courts and other Farragut recreation facilities were relocated into a new community recreation centre, with new amenities and services for existing and new residents.

The study shows how a rich streetscape can be formed between the existing towers and the new fabric (Figure 7). Subtle shifts in the street alignment are generated by the existing position of the towers. These subtle shifts are less normative when viewed against the urban form of New York's urban grid but are contextual in Brooklyn where many street grids shift orientation with a variety of block


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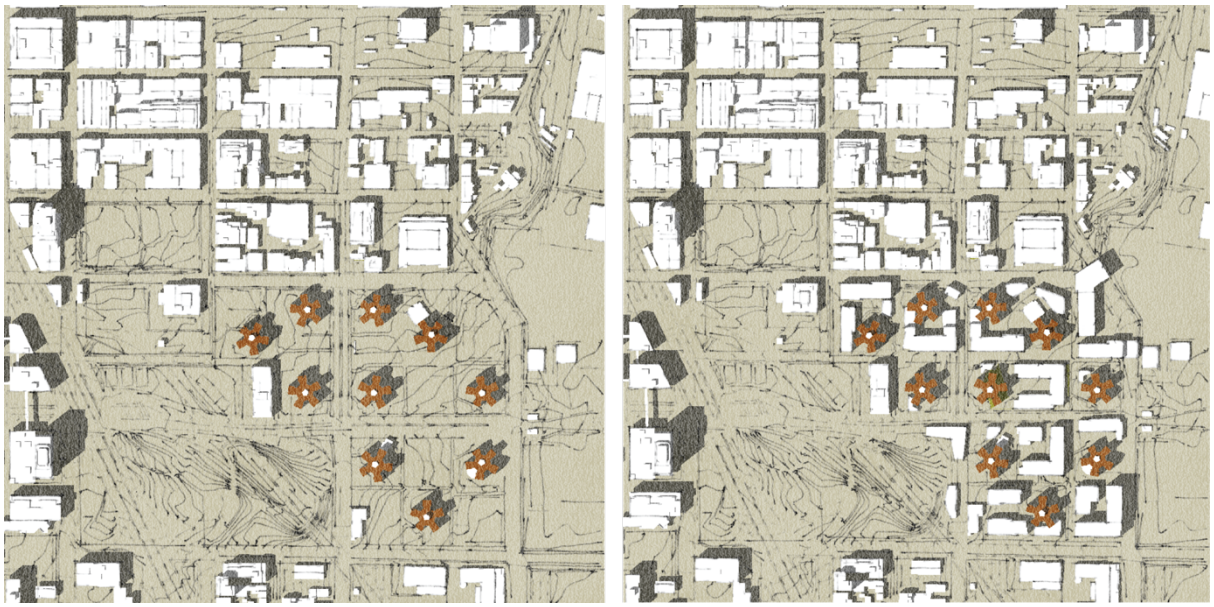
dimensions, generating terminating views where streets jog at intersections. These subtle shifts with diverse perspectival views set up a dynamic urban spatial experience. The new fabric in this urban form creates spatial settings for the towers, making distinct places for each tower. Existing traffic patterns that prioritise higher-speed traffic are calmed with a more distributed pattern of smaller-scale streets. The streets are sized based on the historical condition that survives in the adjacent Vinegar Hill neighbourhood. The scale of the streets promotes a sense of place that is reinforced by the strong definition of the fabric's street walls, consistent with the most walkable streets of Brooklyn.

**Figure 7. Comparison of existing campus and infill study diagram**



The mixed-use spaces of the infill buildings provide new community and commercial spaces at the street front, activating the streets and providing new services and amenities for the existing population. Furthermore, the strategy for the urban form offers a strong potential for each street and block to be mixed regarding income, with public housing, affordable housing and market-rate housing provided throughout the territory. The open space interior of each block is, crucially, made accessible only to the residents of the block, encouraging another scale of interaction among diverse residents.[55] Overall, the envisioned network of streets and public and private spaces in this study are complex and varied based on the existing configuration of the towers, resulting in the potential for a rich sense of place for the community.

## Generating options for existing NYCHA residents

This urban form is intended to demonstrate the potential for a variety of options to be considered and determined by existing NYCHA residents, similar to the UK's council housing redevelopment process. Residents interested in new apartments could be permanently relocated in one of the new buildings. Residents intending to stay in the towers could be moved temporarily while their building is thoroughly repaired and upgraded. The full array of options would be intended to accommodate a wide variety of preferences for the existing residents. At the same time, the density of the new fabric offers significant income to support these options. This exploration of housing density, most importantly, demonstrates the possible integration of the existing NYCHA towers in a connected urban neighbourhood with great potential for mixed-income diversity. This study also demonstrates flexibility where the benefits of the urban form strategy can be maintained, even if the consensus view does not support this maximised density.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## Concluding remarks

This study tests a maximised and comprehensive urban transformation strategy for the redevelopment of NYCHA campuses where significant infill is fundamental to the goal of connectivity, mixed-income integration, healthy and active neighbourhoods and increasing the supply of market rate and affordable housing. This strategy, of course, may not be palatable for most NYCHA residents. However, this does not negate the value of at least considering a more comprehensive approach. The long-term resilience and viability of public housing may depend on addressing the broad urban form issues as much as the repair or replacement of the housing units. This study aims to contribute to the literature that promotes the bidirectional learning between the residents, impartial professionals and city officials. Together, these stakeholders will determine the future of public housing, and there must be a foundation of respect and trust that can be built upon to resolve the current crisis. Social and economic injustice and the pandemic have only reinforced the urgent need for healthy, safe and equitable housing and neighbourhoods. The superblock campuses contribute to a legacy of concentrated poverty and unnecessary social separation of city residents from each other. This separation does not need to be a *fait accompli* for the next generation of children growing up in public housing. If the social/political debates can move to a new level through trust building and mutual respect, a long-term vision may emerge where the repair of the urban form is the indispensable strategy.

## Notes

1 Sissons, Andrews and Bazeley, 'Affordable housing crisis'.

2 van Gent and Hochstenbach, 'Impact of gentrification'; McClure, Gurran and Bramley, 'Planning'; Freeman, 'Neighbourhood diversity'; Schill and Wachter, 'Housing market constraints'; Smith and Choi, 'Mayor's affordable housing'; United States Environmental Protection Agency, 'Attracting infill development'; Carter, Schill and Wachter, 'Polarisation'.

3 Zaveri, 'New York City's housing crunch'.

4 Rand Corporation, 'How New York City can make housing more affordable'.

5 City of New York Department of City Planning, 'City of yes'.

6 Scally and Tighe, 'Democracy in action?'.

7 Angotti, 'Stop NYCHA infill plan'; Angotti and Morse, 'Keeping the public in public housing'.

8 NYCHA, 'NYCHA 2023 fact sheet'.

9 Zillow Inc, 'Fort Greene'. Zillow's analysis shows a significant drop in 2020 median home value from Brooklyn Heights to Fort Green, which includes the land impacted by mid-twentieth century superblock public housing developments. A 2023 report by Corcoran reinforces the high value of land surrounding the NYCHA housing sites; see Corcoran, *Report 3Q2023*.

10 Bloom, *Public Housing*.

11 Regional Plan Association, *NYCHA'S Crisis*; Bach, 'Public housing'; Regional Plan Association, 'Restore the promise of public housing'.

12 Vinnitskaya, 'New York City'.

13 Adams, '2023 state of the city'; City of New York, 'Fixing NYCHA'; City of New York, 'NYCHA 2.0 Part 1'. The latter two issued reports by the mayor's office. Wishnia, 'Will Bloomberg infiltrate Infill'.

14 The current state of the city report cites the budget shortfall at US$40 billion. Adams, '2023 state of the city'; Citizens Budget Commission New York, 'NYCHA's untapped assets'.

15 City of New York, 'NYCHA 2.0 Part 1'.

16 Adams, '2023 state of the city'.

17 A survey of typical articles includes the following: Anderson, 'Pols'; Angotti, 'Stop NYCHA infill plan'; Coltin, 'Infill opponents'; DiPrinzio, 'At NYCHA's Fulton Houses'; Iverac, 'NYCHAs turnaround plan'; Smith, 'Long-delayed development'; Spivack, 'NYCHA backtracks'; Spivack, 'NYCHA mixed-income'; Spokony, 'Kill infill'. Support from the print media for the infill is much less common. For one rare example, see Rein, 'Build out the NYCHA infill'.

18 City of New York, 'Community Board 3'. Community Board 3 led an effort against the infill process in 2013, imploring Mayor Bloomberg to change course. The primary critique was the lack of consultation and involvement of the residents, their associations and the community board and city council members. This effort was joined later by a larger coalition of boards and community organisations. Their 2013 correspondence to the


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NYCHA chairman can be found here: NYC Alliance to preserve public housing, 'Response'; see also reportage on the challenge to process by the Manhattan Borough President: Spivack, 'Manhattan BP'.

19 The most recent example of this is the Fulton and Elliott-Chelsea Houses replacement plan documented in the press; Roche, 'Saving Section 9'.

20 It should be noted that while there is an appropriate dedication advocating for the existing population in the face of a change on this scale, the current condition was only made possible by a radical change in the prior urban condition.

21 Citizens Budget Commission, 'NYCHA 2.0: Progress at risk'; DiPrinzio, 'NYCHA development dreams'; Goldenberg, 'City quietly pauses'; Smith, 'Market-rate apartments'.

22 City of New York, 'NYCHA 2.0 Part 1'.

23 Nahmias, 'NYCHA'; Plitt, 'NYCHA parking lot'.

24 Hylton, 'World's tallest passive house'; Spivack, 'NYCHA backtracks'.

25 Melcher, 'Reimagining NYCHA's towers'.

26 NYCHA and US HUD, 'Draft PHA agency plan'.

27 Costantino, 'Planned development'.

28 Bronx Times, 'Mill Brook Terrace'.

29 NYCHA, 'Fulton and Elliott-Chelsea Houses'.

30 This calculation relies on data provided by NYCHA, 'Data book 2022'.

31 Roche, 'Saving Section 9'.

32 Watson and Beck, 'Public housing revolution'.

33 Ministry of Housing, Communities & Local Government, 'A decent home'.

34 Woodberry Life, 'About Woodberry Down'; Hackney.gov.uk, 'Colville Estate'.

35 Regional Plan Association, *Time to Act*.

36 Seattle Housing Authority, 'High point redevelopment'.

37 Blue Zones, 'Blue zones project'; Happy City, 'Happy City': these sites discuss important aspects of the evolution of urban planning around health and happiness. See also City of New York Department of City Planning, 'Active design guidelines'; ARUP, 'Walking world'.

38 ARUP, *Cities Alive*.

39 Husock, 'Re-streeting NYCHA's problems'; Husock, 'Re-streeting the projects'.

40 An on-going studio by Frederick Biehle at Pratt Institute is exploring this issue. Some of this work can be seen here: Pratt Institute and Biehle, 'Re-Inventing public housing', 49.

41 The NYCHA Data book lists the campus area as 16.1 acres. This calculation does not include the roads between the superblocks. NYCHA, 'Data book 2022'.

42 With eight alleys also woven into the blocks, this combination of three levels of street typology was unique to this neighborhood. Hugo Ullitz, 'Brooklyn, Vol. 1, Double Page Plate No. 1; Part of Wards 1, 2, 4 & 5, Section 1' [Map bounded by East River, Gold St., Hudson Ave., Little St.; Including Navy St., Johnson St., Pierrepont St.]; Sub Plan No. 1; [Map bounded by Hudson Ave., East River, U.S. Navy Yard; Including Little St., Marshall St.]; E. Belcher Hyde Map Company, New York, 1916, accessed 29 March 2024, New York Public Library Digital Collections, https://digitalcollections.nypl.org/items/6c05633e-3bde-b9cf-e040-e00a18063bc7.

43 Old NYC is a resource that has geo-referenced historical photos of the neighbourhood; see https://www.oldnyc.org/.

44 The limited access to the open space was noted by the NYCHA manager of the campus during a tour for a college class. This is a function of both security and limiting nuisance for residents.

45 Jacobs, *Death and life*, 34–5.

46 Jacobs, *Death and life*, 34.

47 NYCHA, 'Guidebook 2020'.

48 As noted above in the case of the Mill Brooks Houses.

49 The method of determining the unit count is the following: the total residential gross floor plate area is reduced by 15 per cent for exterior wall, amenity, circulation and mechanical space. This net number is then divided by an average unit size of 660 square feet per unit, using the average size unit data from RentCafe, 'Brooklyn'.

50 This calculation is based on a site area expansion that reworks the existing road network. The site area is calculated to be 24.25 acres, increased from the NYCHA calculation of 16.61 acres. NYCHA, 'Data book 2022'.

51 City of New York Department of Planning, 'NYC population finder'.

52 This calculation relies on data provided by NYCHA here: NYCHA, 'Fulton and Elliott-Chelsea Houses' that inputs the new programme for these sites described in the NYCHA press release. See NYCHA, 'Residents'.


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[53] City of New York, 'Mayor Adams'.

[54] Rand Corporation, 'How New York City can make housing more affordable'.

[55] New York Housing Conference, 'Navy Green'. Navy Green, a mixed-income development on a block near the Farragut Houses, offers a strong model for providing private shared open space for all residents of the block, including supportive housing residents. This site discusses the community impact of this strategy.

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### Research ethics statement

Not applicable to this article.

### Consent for publication statement

Not applicable to this article.

### Conflicts of interest statement

The author is a current guest editor of this journal special issue. All efforts to sufficiently anonymise the author during peer review of this article have been made. The author declares no further conflicts with this article.

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