

## Appendix D

### Case Study: Urban Consolidation, Sydney, Australia



#### Overview

Sydney is the capital of New South Wales (NSW) and the largest city in Australia by population. Sydney serves as the “gateway” between Australia’s major eastern cities and regional centers such as Tokyo, Shanghai, Hong Kong, and Singapore (NSW Government 2010, 1). The dominant type of residential development in Greater Sydney is separate houses (58.9%), while high-density dwellings make up 70.2% of dwelling structures in the small central City of Sydney (Australian Bureau of Statistics 2011).

#### History and Key Players

Urban consolidation has been Sydney’s primary planning approach since the 1980s; however, the rise of the Labor Party in NSW in 1995 led to policy reframing. In Australia, state governments are the entities with constitutional authority in spatial planning and infrastructure provision and do not need approval by federal or local authorities (Searle and Bunker 2010, 164). As such, state governments

Higher density infill housing in a new transit-oriented development near the Sydney airport.

*Photo: Collection of Ann Forsyth*

create highly detailed, prescriptive metropolitan plans that serve as blueprints for infrastructure organization and investment (Searle 2010, 164). City councils are directed to implement these plans through zoning changes and sub-regional plans. The metropolitan plans often rely on private investment for the development of their strategies (Searle and Bunker 2010, 166).

### Project History and Current Issues

Urban consolidation is an approach that seeks to create a denser—and ostensibly more efficient—urban form (Searle 2007, 1). Urban consolidation is expected to reduce state spending by containing sprawl and the costs of far-flung infrastructure expansion. NSW planners adopted consolidation policy in the 1980s. They aimed to reduce infrastructure costs, create higher-density housing, increase housing affordability, bolster public transit, and improve access to jobs and services in the face of reduced state funds and high oil prices (Searle 2007, 2).

Implementation of consolidation strategies became a point of local contention, however. Older suburban communities and their local councils resisted, fearing degradation of open space, streetscape, and privacy (Searle 2007, 2-4). These worries were not unfounded. Dual occupancy policies (policies that allowed accessory dwellings in many locations) did stimulate increased subdivision, but in some cases lack of design controls allowed overbuilding and shifts to unattractive streetscapes (Searle 2007, 5). Furthermore, density requirements for greenfield development led to increased medium-density development at the urban fringe, with limited access to public transit and employment (Searle 2007, 5). Despite these challenges, by 1995, multi-unit approvals comprised 60% of Sydney's total dwelling approvals, up from 34% in 1989-90 (Searle 2007, 7).

When the Labor Party was elected to state government in 1995, the emphasis of urban consolidation efforts shifted to greater local determination and development of older industrial areas with weak community presence (Searle 2007, 7). The government directed Landcom, the state development agency, to sell off its suburban property and focus on promoting private sector development of inner city lands (Searle 2007, 7-8). In response to backlash against new urban consolidation projects, the state government pursued measures to improve residential flat (apartment) design (Searle 2007, pp. 10). For example, the State Environmental Planning Policy (SEPP) No. 65 – Design Quality of Residential Development stipulated that all three or more story buildings with four or more flats must be designed by certified architects (Searle 2007, 10). The SEPP also enumerated 10 design principles that local plans must address. To further explain principles and best practices for apartment design, the NSW government published a Residential Flat Design Pattern Book in 2001 (Searle 2007, 10).

The 2005 NSW metropolitan plan, *City of Cities: A Plan for Sydney's Future*, sought to mitigate a surge in housing prices by identifying new areas for urban development in the north west and south west, focused on strategic employment centers and areas along transit corridors (Searle 2007, 11). The plan called for development corporations to expedite development processes, which were more complicated with brownfields than with greenfield sites, due to more fragmented land ownership and possible opposition from existing residents (Searle 2007, 12). These corporations were to have similar powers to the City West Development Corporation, which the state government created in 1992 to administer government sites and provide infrastructure in the central city redevelopment of Pyrmont-Ultimo's (Searle 2007, 6 and 12).

*The Draft Metropolitan Plan for Sydney 2031* expands upon the 2005 plan by incorporating components of the \$AUS 50.2 billion Metropolitan Transport Plan. It seeks to create a “multi-centered, more connected, integrated global city” continuing a tradition of multiple centers outlined in metropolitan plans since the 1940s (NSW Government 2010, 2). The plan proposes concentrated growth organized around nine “city shapers”—areas with transport connections, housing, jobs, and other infrastructure (NSW Government 2013, 7-8). It also seeks to strengthen Parramatta as a second central business district (CBD) and to support growth of specialized employment centers (NSW Government 2013, 10).

Some critics argue that planners will need to more explicitly confront social inequity in Sydney and consider their own roles in channeling market forces for the public good. Otherwise, *The Draft Metropolitan Strategy* “risks reinforcing a planning system which has become defined in terms of development feasibility alone rather than a broader, strategic sense of getting housing ‘right’ in order to build a more efficient, productive and equitable city” (Pingree and Randolph 2013, 4). Increased use of evidence in strategic planning purposes may help to support public engagement (Pingree and Randolph 2013, 6).

A new mixed-use town center in Rouse Hill in outer suburban Sydney. The center combines civic uses, shopping, and housing.

*Photo: Collection of Ann Forsyth*



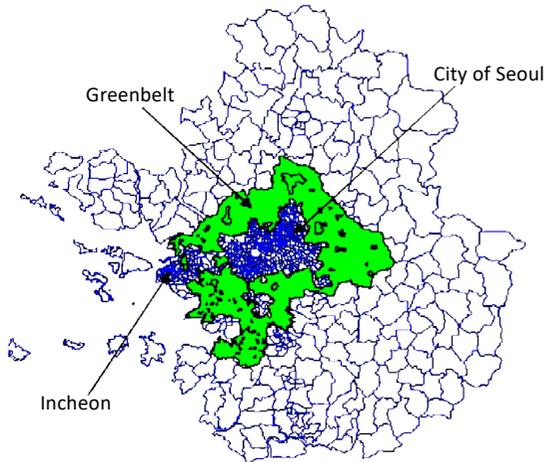
## Key Questions Raised

- What methods allow for successful implementation of large-scale plans at the local level given local resistance and variation in needs among localities?
- How can government entities direct market forces and maximize accountability, coordination, and security for public-private partnerships?
- How can government entities create sufficient certainty for developers, investors, and community members without planning in a way that is excessively prescriptive?
- How prescriptive and detailed should plans be?
- What kinds of design guidelines should planners use to shape the impacts of development on community character and streetscape?
- What kinds of evidence should planners use to form and rationalize their plans and to engage community members?
- How should planners respond to emerging global problems like climate change?

## Implications for Other Communities

- Implementing densification or consolidation policies can take decades.
- Planning should incorporate flexibility to consider social, economic, and environmental dynamics on more granular scales.
- Interactions with developers may cut across levels of government; public-private partnerships can provide a forum for broader planning conversation.
- Planners should periodically step back to ensure that planning strategies have not reverted to a string of reactions and still embody desired policy objectives.

## Case Study: Greenbelts, Seoul, Korea



Seoul's extensive greenbelt.  
*Source: Bengston and Youn 2006, 4.*

### Overview

Greenbelts are one type of urban growth containment policy that has been used in many cities and regions around the world. The greenbelt created around Seoul, Republic of Korea is a long-standing example of an attempt to stymie urban sprawl and encourage sustainable growth.

In 1970, the Korean economy was growing at a rapid pace, inducing great population growth and migration from rural to urban centers; Seoul's growth rate from 1950-1975 was 7.6%, the fastest in the world (United Nations 2002).

Technical Description: "Seoul's greenbelt is very large, consisting of a band of green space, similar to a park, averaging about 10 km wide, beginning about 15 km from Seoul's central business district. After being extended four times, by 1976 Seoul's greenbelt was 1,566.8 km<sup>2</sup>, which amounts to 13.3% of the entire Seoul Metropolitan Area" (Bengston and Young 2006, 3).

### History and Key Players

Using the greenbelts of London as an example, President Park Chung Hee introduced Korea's greenbelt system in 1971. The central government's Ministry of Construction submitted an alternative green

belt proposal to the National Assembly and it was settled through legislation from the National Assembly two months later (Kim and Kim 2008, 41). The City Planning Law of 1971 and the National Comprehensive Physical Plan of 1973 designated greenbelts around fourteen cities in Korea, including Seoul. The greenbelt system was adapted in the Korean context and implemented as a very top-down initiative; the boundaries were defined without public input.

### Approach

In evaluating the greenbelt, Bae (1998) articulated seven objectives for the Seoul greenbelt.

1. Promote national security, as the greenbelt allowed the government to control the demilitarized zone of Seoul
2. Removal of illegal shantytowns on the edge of the city
3. Contain urban sprawl
4. Reduce rapid population growth and industrial concentration
5. Limit land speculation
6. Protect agricultural land
7. Safeguard environmental and natural resources in the area

### Project History and Current Issues

Once established, the greenbelt underwent revision and has been a focal point of many political platforms over the years. Continuous political turnover and disparate visions for the revision of the greenbelt have made change slow and contentious and public discussions were not allowed at the time of the Park regime (Lee and Linneman 1998), so the greenbelt policy was altered very little for almost thirty years. Political crises and a coup d'état in 1980 and eventual democratization in 1987 changed the political atmosphere, leading to calls for greenbelt reform.

Additionally, rapid urbanization of Seoul put pressure on the restrictive greenbelt.

Early criticism of the greenbelt plan was stifled as discussions of problems associated with it were prohibited until the end of the Park regime in 1979. As land use regulations of the greenbelt were relaxed in the 1990s, development in designated “semi-urban” and “semi-agricultural” areas was patchwork and not cohesive, making it difficult for residents to tolerate development regulations. Once Kim Dae Jung won the presidential election of 1997, the National Committee for Greenbelt Policy Reform was established. This committee was chaired by a professor at Seoul National University and included three greenbelt residents, one environmental group, twelve scholars, three government officials, and three journalists (Park 2001). The Committee recommended the maintenance of the greenbelt as a growth management tool, but with adjustments in which zones should be lifted around small- and medium-sized cities. In large cities, the greenbelt boundaries were to be based on environmental assessments. The committee also dealt with the problem of windfall financial benefits due to relaxed boundaries, compensation for landowners in greenbelt areas, and development in villages within greenbelts. This reform report met opposition; a new policy in 1999 further relaxed and reduced the greenbelt (Kim and Kim 2008, 47).

Political debates about further reform of the greenbelt continued through the 2000s. By 2005, a final greenbelt adjustment plan for the Seoul metropolitan area was completed. This plan proposed clusters of land to be released for development rather than fragmented areas. Business areas and housing development areas were increased to minimize departure of residents from greenbelt areas.

## Key Questions Raised

- The greenbelt has mixed reviews by Koreans. Some enjoy the recreational use of the park and appreciate the reprieve it provides from the city. Others, mainly landowners in the greenbelt, have historically felt the development of the greenbelt was unjust, as they were not initially compensated for the land. Still others suffer from longer commuting times and confusing development regulations attributed to the greenbelt. As Bengston and Young outline: “Lee (1999) cites several surveys conducted in the 1990s that drew strong support from citizens, environmentalists, and Korean planners, but most greenbelt property owners who viewed it as a seizure of private property, opposed the policy” (Bengston and Young 2006, 6).
- The costs and benefits for growth management and sustainable development are also open to debate (Bengston 2006).

## Implications for Other Communities

- Seoul’s greenbelt has been a major success in terms of open space. It conserved the area’s heritage rooted in nature and its essential ecosystem services (Bengston 2006). “Seoul’s greenbelt has been remarkably successful at protecting important agricultural land, providing badly needed recreational resources in a megacity with few parks, protecting the beauty and natural heritage of the ancient capital of Korea, and maintaining vital ecosystem services” (Bengston 2006, 11).
- The greenbelt may have caused leapfrog development, with longer commutes for residents of new housing constructed outside the greenbelt.
- The greenbelt is associated with higher land and housing prices in urban areas around the greenbelt, causing land developers and owners to call for a review of the policy, and adding to commuting costs and congestion.
- Compensation of greenbelt owners is a particularly important issue.

**Table D.1 Development control in the greenbelt**

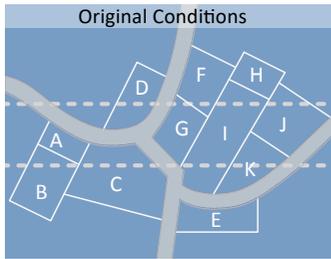
Classification	Main Contents
<b>Banned development activities</b>	<ol style="list-style-type: none"> <li>1. New building construction</li> <li>2. Installation of facilities</li> <li>3. Alteration of land use</li> <li>4. Land subdivision</li> <li>5. Cutting trees for lumber</li> <li>6. Urban planning business [Note: this is unclear in the original.]</li> </ol>
<b>Permitted development activities</b>	<ol style="list-style-type: none"> <li>1. Construction of buildings and facilities for public use</li> <li>2. New construction</li> <li>3. Installation of facilities for agriculture and fisheries</li> <li>4. Extension, reconstruction, and change of use of houses existing at the time of the area's designation as a green belt</li> <li>5. Reconstruction and change of use for non-residential buildings and facilities</li> <li>6. Transferring construction of demolished buildings and facilities by public development</li> <li>7. New construction of facilities to improve residential life [public facilities]</li> <li>8. Alteration of land character that is not against its original purpose</li> <li>9. Land separation without new construction</li> </ol>

Source: Kim and Kim 2008, 4, from Ministry of Construction and Transportation 2000, as cited by Kim and Kim.

## Case Study: Land Readjustment, Japan

### Step 1

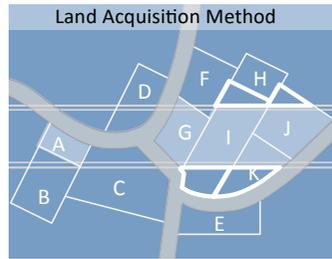
Identify issue: Insufficient street system



- The streets are not wide enough which, may cause problems in an emergency.
- Land parcels B and H have no street access.
- Shapes of some land parcels are unsuitable for development.
- Land value is lower than developed area.

### Step 2

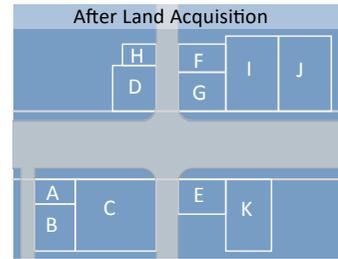
Acquire land



- Landowners A and G have to move out.
- Landowners K and J land become too small for a building.
- The land parcel of landowner I has to be divided into smaller ones.
- Landowner F enjoys much greater benefits than the others.

### Step 3

Reassign lots, while maintaining original land area



- Everyone can stay in the community.
- Everyone enjoys the benefits fairly.
- The shape of every land parcel is improved in the process.
- Now the land of landowners B and H come to face a road.

## Overview

Land readjustment (LR) is a strategy through which adjoining landowners pool some or all of their land; develop infrastructure; sell off a portion of the land to cover the infrastructure development, planning, and administrative costs; and redistribute the remaining land among the original landowners (Sorensen 2000, 52). This is managed through a government process.

The figure above presents a comparison between conventional land acquisition strategies and land readjustment projects. Commonly, landowners must donate at least 30% of their landholdings for inclusion in a land readjustment project (Sorensen 2000, 52).

The following benefits have been identified as rationales for pursuing land readjustment projects (Sorensen 2000):

- Land readjustment can be a means for the private sector to

Comparison between conventional land acquisition and land readjustment (LR).

*Based on Vergel 2012, 2.  
Diagram by Jorge Silva.*

deliver urban land and infrastructure development, thus allowing the government to spend money on other priorities such as industrialization (58);

- Land aggregation and development for land readjustment projects is relatively inexpensive, because (at least in theory) landowners willingly pool their land with little to no government compensation (54);
- Landowners may be less inclined to oppose land readjustment than other development processes because they retain title to most of their land (54);
- Original landowners benefit from new infrastructure and increased land values (54);
- LR is a form of “betterment taxation,” as the beneficiaries of the infrastructure and land development (the landowners) bear the costs (59); and,
- LR discourages sprawl by creating a framework for orderly growth (Sorensen 1999, 2356).

### Land Readjustment in Japan explained

By the late 1990s, about one third of Japan’s urban areas had been developed through land readjustment, typically on the fringes of growing cities (Sorensen 1999, 2333). In Japan, there are five types of executors for land readjustment projects: individuals, associations, local governments, administrative agencies, and public corporations, with the first two distinguished as private entities and the latter three as public (Sorensen 2000, 52). Associations are organizations that include “all owners and lessees of land in the project area” (Sorensen 2000, 53).

While in some examples local governments directly manage their land readjustment projects, in more populous cities local governments set up a nonprofit corporation, formally separate but working in close collaboration. The corporations can reduce their borrowing needs by pooling funds from different projects. This is particularly significant because land readjustment typically requires high up-front costs, with revenues toward the end of the project (Sorensen 2000, 68).

The impacts of land readjustment policies in Japan have been heavily shaped by highly fragmented ownership of agricultural lands (Sorensen 2000, 2335). On top of this, farmers have historically been very politically powerful, which has led to policies encouraging the holding of small agricultural parcels. For example, below-market taxation for farmland increases the favorability of holding agricultural land on the urban fringe in expectation of rising land prices (Sorensen 1999, 2337). Regulatory loopholes also facilitate development of extremely small

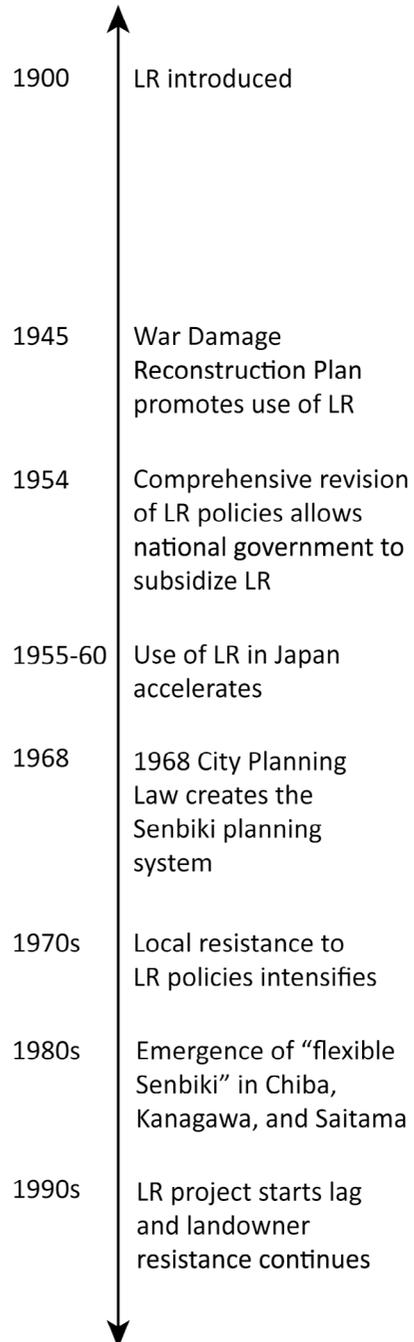
agricultural plots. Exempting developments of 0.1 hectares or less from development permission requirements has encouraged subdivision and led to an uncoordinated patchwork of urban and agricultural parcels (Sorensen 1999, 2338). This fragmented context complicates development of land readjustment projects.

### History and key players

Land readjustment was first used in Japan around the turn of the 20th century, following the German model (Sorensen 2000, 52). Land readjustment met resistance at the local level following WWII, in spite of plans and legislation that promoted its use, illustrated in the timeline at right (Sorensen 2000, 63).

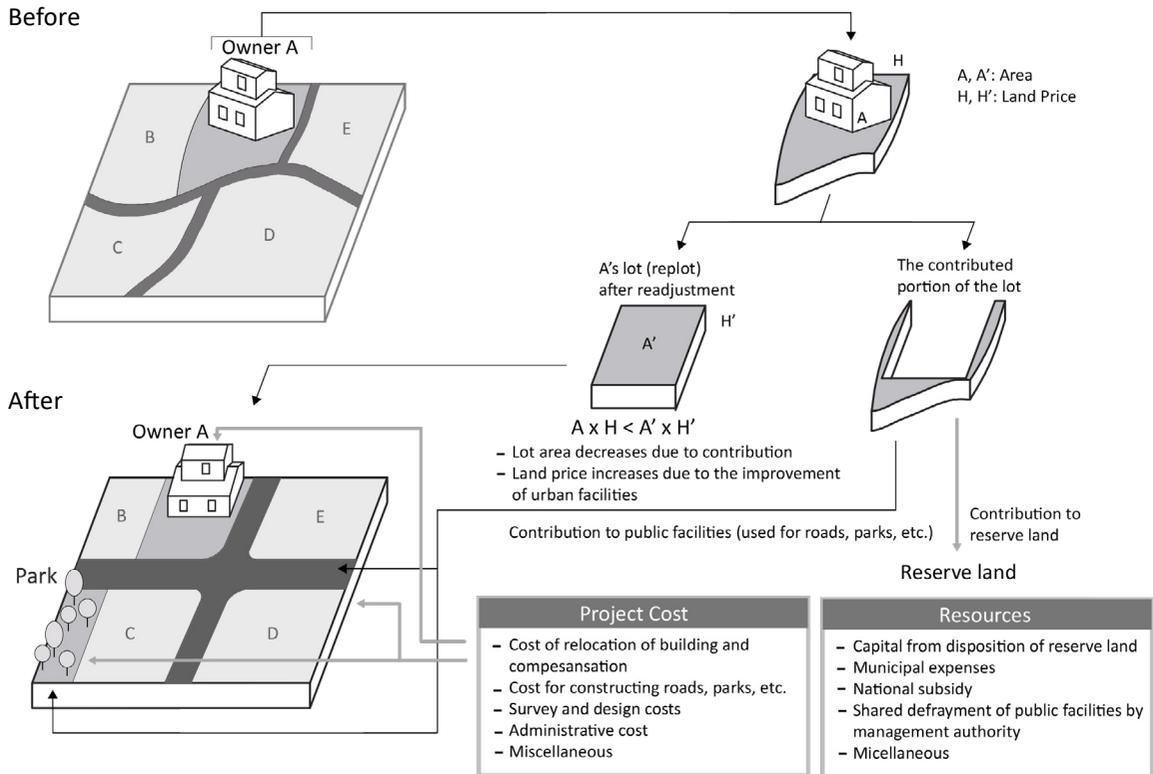
Comprehensive revision of land readjustment policies in 1954 enabled the national government to subsidize land readjustment projects initiated by local governments (Sorensen 2000, 52-53). Subsequently, subsidies drawn from the national Road Improvement Special Account became important sources of funding (Sorensen 2000, 53). Implementation of land readjustment was also facilitated by legal structures providing that projects initiated by local governments did not require landowner consent. This contrasts with privately initiated land readjustment projects, which require consent from two-thirds of landowners owning two-thirds of the pooled land (Sorensen 2000, 63).

Another policy pertinent to land readjustment is the 1968 City Planning law, which sought to control sprawl in suburban areas by creating a planning system called Senbiki and a permission system for land development (Sorensen 1999, 2337). Senbiki designated two types of city planning zones: “the Urbanisation Promotion Area (UPA), which includes existing built up areas and areas intended to be developed within 10 years, and Urbanisation Control Areas (UCA),



Land readjustment timeline in Japan.

Source: Adapted from Sorensen 2000; and Sorensen 1999. Diagram by Virginia Kessler



where urbanization is to be restrained” (Sorensen 2000, 64-65). The planning system (Senbiki), the development permission system, and land readjustment were meant to function together to promote orderly growth.

Land readjustment process diagram.

Source: JICA 2014, 10

Resistance to land readjustment policies eventually intensified, thus delaying construction schedules and threatening careers of local politicians (Sorensen 2000, 63). This demonstrated the importance of “gaining the prior agreement of local land owners” (Sorensen 2000, 64). In the 1980s, rapid urban sprawl led to the emergence of “flexible Senbiki” in Chiba, Kanagawa, and Saitama, the three main suburban prefectures near Tokyo (Sorensen 2000, 64; Sorensen 1999, 2342). The policy provided that land readjustment projects in UCAs could be up-zoned to UPA in order to increase development and improve profits, while underdeveloped areas in UPAs, termed “Designated Problem Areas,” would be downzoned to UCA if action were not taken to launch land readjustment organizing committees in those areas (Sorensen 2000, 65). Nonetheless, by 1997, land readjustment projects had begun in only 35% of the Problem Areas in the Saitama prefecture, and landowner opposition persisted (Sorensen 2000, 65).

## Criticisms of Land Readjustment

Extensive spatial and qualitative analysis from Sorensen (1999, 2339) demonstrates key disadvantages to the use of land readjustment for urban development. Sorensen's research indicates that the land readjustment is so complex, costly, and time-intensive that it is unattractive for private entities to initiate land readjustment projects. Interviews with local government planners suggest that the preparation time for legal initiation of a project takes 5-10 years of steady work by 3-5 local government staff, significant outreach with landowners, and specialized skills to carry out the development process (Sorensen 2000, 67-69).

Sorensen's analysis also challenges the beneficial outcomes of land readjustment, suggesting that land readjustment does not in fact create an ordered pattern of development across the landscape. For practical reasons, land readjustment projects are typically limited to 40-150 hectares, and thus create a "scattering of LR projects" accompanied by little infrastructural improvement in the surrounding areas of urban sprawl (Sorensen 1999, 2354-6).

Finally, Sorensen suggests that the land readjustment in Japan may fail to mitigate economic inequities. Landowners tend to wait for land prices to rise before building-up and selling their land, thus further preventing the poor from gaining access to land (Sorensen 2000, 60). Additionally, large landowners also tend to benefit more from increases in land prices than do small landowners (Sorensen 1999, 2340).

Despite these challenges, land readjustment has spread internationally as a planning mechanism. This has been enabled in part through foreign aid from the Japanese International Co-operation Agency (JICA), the Japanese Ministry of Construction (MOC), and the Japanese Overseas Economic Co-operation Fund (OECE) for financing and administrative support for land readjustment in countries like Indonesia, Nepal, Thailand, and Malaysia (Sorensen 2000, 56). JICA has also helped to introduce land readjustment principles to planners in Colombia and Brazil (Vergel 2012).

## Key Questions Raised

- Under what circumstances can land readjustment be implemented as a planning strategy elsewhere?
- What planning frameworks are needed in conjunction with land readjustment to help promote both orderly growth and greater access to urban amenities for the poor?

- If land readjustment projects are costly and time intensive, what strategies can be implemented to facilitate and expedite the negotiation process?
- How should public opinion or participation be integrated into the development and planning process?
- In what capacity should urban development and infrastructure be provided by the private sector? To what extent and when should it be provided by the public sector?
- How can the private sector best be held accountable for developing adequate infrastructure?

### Implications for Other Communities

The significant costs associated with land readjustment in Japan point to potential complications with implementing this tool in other countries. As Sorensen (2000, 69) suggests: “An activist local government, with sufficient staff and resources to be able to sustain an active organizing program over many years is clearly required.” Land readjustment will not necessarily function as a consensus-based process; particularly in countries with strong property rights, considerable resources must be expended to gain consent from opposing landowners. Additionally, if countries rely on the private sector to provide infrastructural improvements and investment fails to materialize, developing the infrastructure later may prove more expensive than if they had been provided by the government while land prices remained low (Sorensen 1999, 2355). The case of land readjustment in Japan illustrates the inadequacy of relying solely on particular planning tools to promote orderly growth: a more comprehensive planning regime is needed (Sorensen 2000, 70).

## Case Study: Corridor Housing Initiative (CHI), Twin Cities, Minnesota, USA



### Overview

In the early 2000s, Minneapolis's comprehensive plan proposed developing new housing along transit routes. However, building did not proceed smoothly as housing developers encountered fierce opposition from neighborhood groups who felt they had not been included in the project planning process. Gretchen Nichols of the Center for Neighborhoods in the Twin Cities was the initiator of a process that would bring together neighborhood groups, developers, and city officials.

Twin Cities workshop participant looking at images of local housing of different densities.

*Photo: Collection of Ann Forsyth*

In each corridor the initiative process started with a steering committee of city planning staff and representatives from community groups, business associations, and other critical stakeholders. That committee reviewed planning documents, identified key issues, and planned outreach events to educate members of the community about the development process. The goal was to produce a development preferences sheet that acts as guidelines for future development in the neighborhood.

### Project History and Current Issues

From 2003-2010, Corridor Housing Initiative (CHI) worked in 19 corridors in the Twin Cities metro area, as a successful strategy to

promote community acceptance, the project was reproduced in a modified form in Chicago. Four out of the first five corridors where the program worked had projects in the pipeline as of 2010 (Forsyth et al. 2010, 269-270).

Neighborhood groups in the central cities, which had a history of opposing new development, were the focus of the first CHI projects. Groups applied to be part of the steering committee process.

For each project, members of these community groups—as well as business leaders and other neighborhood stakeholders—were joined by city officials and developers interested in the neighborhood as equal partners in dialogue. Once assembled, the steering committee reviewed previous planning efforts, proposed promising development sites, and designed a community outreach process (Forsyth et al. 2010, 271-272).

Typically, the process involved initial steering committee meetings; a public meeting meant to identify local concerns; a focus group with neighborhood business leaders and developers; a second public meeting to explain local development conditions; a third public meeting where business leaders and developers talked about the opportunities and challenges they faced in the neighborhood; and a final meeting to determine the neighborhood's development preferences (Forsyth et al. 2010, 272).

The second public meeting featured an interactive project called the block exercise that participants described as “transformational.” During the block exercise, participants created hypothetical development options using an aerial photo of the neighborhood and blocks representing standard unit sizes. A designer made a sketch of what the development option would look like in the context of the neighborhood. A development consultant then produced a quick pro forma based on local assumptions for development fees, construction costs, and rents. In the course of a single meeting,

community members gained a rich lesson in how design can ameliorate perceived issues with new development, and in the types of tradeoffs in terms of density, parking, and open space that developers must make in order to make projects feasible (Forsyth et al. 2010, 273-275).

The Corridor Housing Initiative (now the Corridor Development Initiative) is primarily an educational and capacity-building program. It was meant to result in a savvier public that could engage more productively with city planners and developers. This capacity would diminish over the years as people move out and new residents who have not been involved in the program move in.

### Key Questions Raised

- How can residents engage with the city and the development community to get the kind of development they want for their neighborhood?
- How can the city and the development community make plans that are palatable to powerful neighborhood groups?
- How can capacity building be effective in communities where people move in and out?

### Implications for Other Communities

- Bringing residents and their government closer together can yield relationships that make the development process more fruitful for everyone.
- Understanding that a high-quality development is in the best interests of residents, builders, investors, and the city is the foundation of future conversations between all parties.
- Providing attractive design visualizations helps residents understand that what they imagine to be the negative aspects of development can actually exist in a contextually sensitive way.

## Case Study: Special Area of Social Interest (ZEIS), Brazil

### Overview

The concept of ZEIS, Special Zone of Social Interest, was first devised at the local level in several cities in Brazil. The main objectives of ZEIS are:

1. Allow the inclusion of groups of people who have been marginalized in the city.
2. Introduce services and urban infrastructure in places where they did not reach before, improving the living conditions of the population.
3. Reduce the quality differences in the urban land market that currently exist based on different patterns of residency, and reduce price differences between them.
4. Introduce mechanisms for direct participation of residents in the process of defining public investments in urbanization to consolidate the settlements.
5. Increase city collection of taxes and fees.
6. Increase land supply for low-income urban markets.

In the 1980s, various cities, including Curitiba and Recife, attempted to include provisions regarding informal settlements in their Master Plans. They proposed a zoning category within land use plans with distinct urban parameters for substandard settlements (Smolka 2013). Primarily, the parameters recognize the rights of families illegally occupying land, giving them the opportunity to regularize their situation without the pressure of real estate speculation or the threat of eviction. Though the objective is to regularize and legalize, the ZEIS also “embodies the idea that the ‘right to use’ can be legally recognized even when the ‘right to property’ is absent” (Macedo 2008, 265). Two legal tools used with ZEIS are *Usucapião urbano* and concession of the real right to use *Concessao de Direito Real de Uso* or CDRU, explained in the table.

States establish low-income areas as ZEIS and promote re-qualification, legalization, and urbanization by following Plans of Urbanization, formulated with the participation of the affected low-income populations. The objective is to protect areas from real estate speculation by designating them as areas for low-income housing. Similarly, ZEIS also subjects existing low-income neighborhoods and favelas—a type of low income settlement in which residents do not have claims of ownership to the land—to rules of occupation (Budny 2007, 3). Additionally, ZEIS potentially increases local tax revenues by requiring newly integrated families to pay property taxes and public service fees (Macedo 2008, 266).

Table D.2 ZEIS Tools

Tool	Definition	Use
<b>Collective adverse possession</b>	Adverse possession is a doctrine under which a person in possession of land owned by someone else may acquire valid title to it, so long as certain common law requirements are met, and the adverse possessor is in possession for a sufficient period of time, as defined by a statute of limitations.	<i>Usucapião urbano</i> creates the ability to establish uncontested title of ownership for residents who have squatted continuously for five years on small lots of urban land, given no legitimate opposition to the change in title (Budny 2007, 2) “the instrument has successfully established uncontested titles of ownership to people who bought their land but could not get their deeds either because they bought the land from swindlers or because there are irregularities in the subdivision of lots” (Budny 2007, 5).
<b>Concession of the real right to use</b>	Real Concession Rights Agreement of Use. It can be free or paid, individual or collective. It is the Administrative Agreement that transfers real property rights.	CDRU may be applied in cases in empty areas intended for housing provision; in occupied areas, subject to real pressure or areas of land conflict; sustainable use of wetlands and the security of tenure of traditional communities; and for commercial purposes. The CDRU is accepted as collateral in mortgage contracts.

*Adapted from Budny 2007.*

## Context

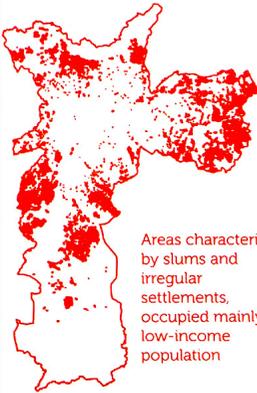
### History

Historically, Brazil had minimal state-owned land and a significant proportion of land was privately owned. During military rule and up until the 1988 Constitution, urban interventions at the federal level frequently neglected popular housing needs and the housing deficit was exacerbated over time and estimated at least 10 million units (Fernandes 1997, 3).

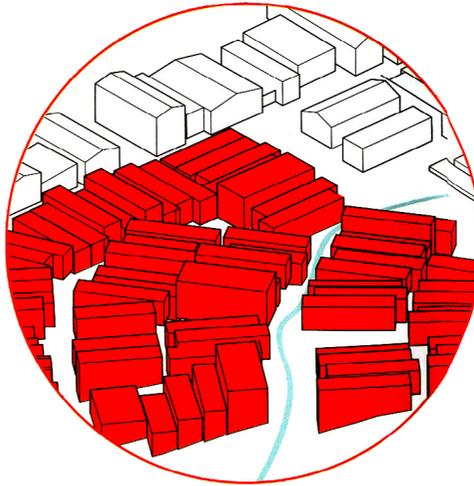
As cities in Brazil were urbanized, municipal and state government was virtually excluded from the control of land division, apart from the formal approval of plans and projects submitted by developers, leaving developers “to predetermine,

according to their own interests, the way they intended to divide the areas” (Fernandes 1997, 9). Often the best portions of state owned urbanized land was designated for industrial use while private developers owned most of the remainder, leaving little space for low-income residents, who were often placed in illegal and precarious situations (POLIS 2004). Intense speculation encouraged land hoarding by private landowners, leaving vacant plots throughout metropolitan areas as owners waited for land values to rise. Vacant lots created an inefficient, costly, segregated, and environmentally unfriendly pattern of development (Fernandes 1997, 1).

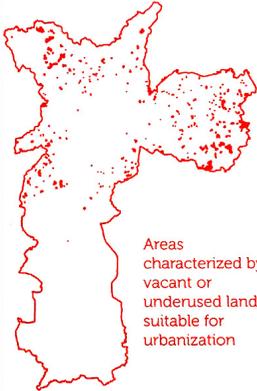
**ZEIS 1**



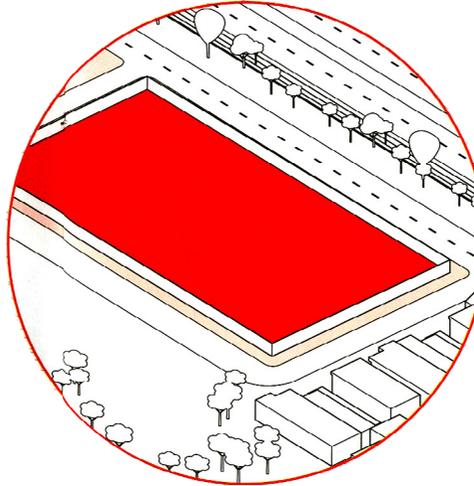
Areas characterized by slums and irregular settlements, occupied mainly by low-income population



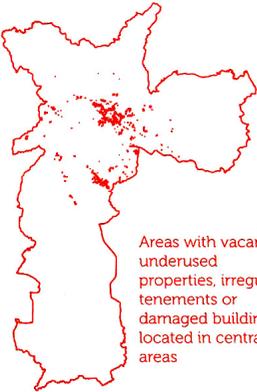
**ZEIS 2**



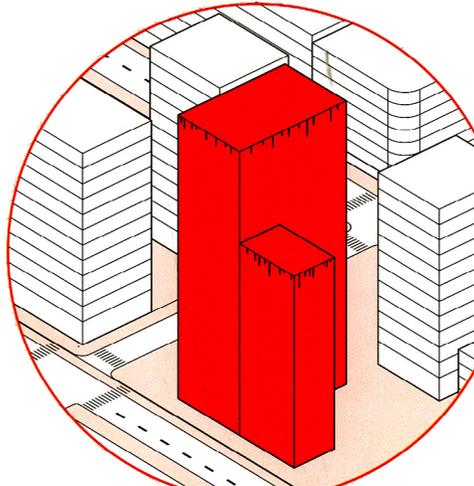
Areas characterized by vacant or underused land, suitable for urbanization

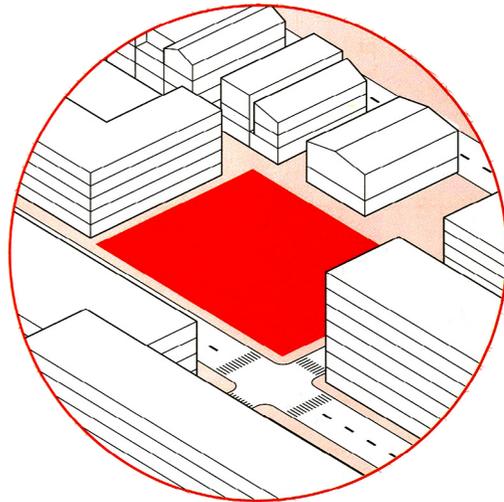
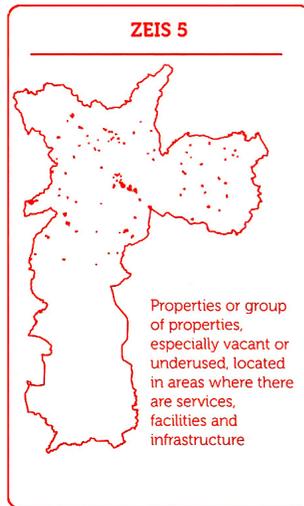
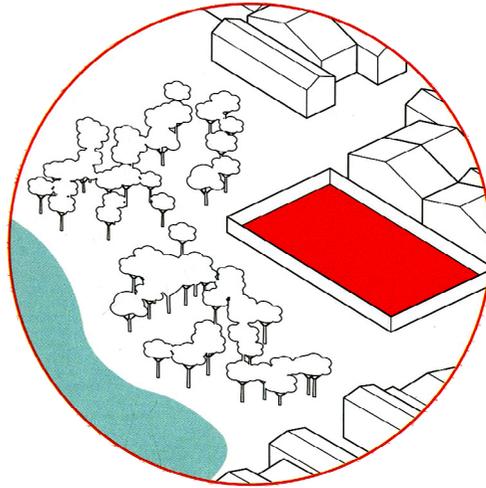
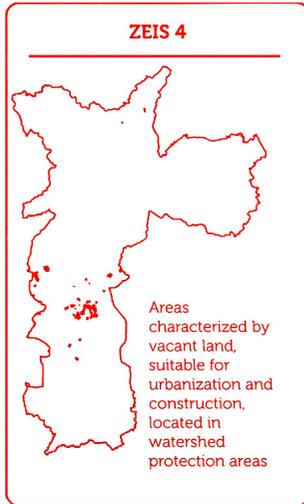


**ZEIS 3**



Areas with vacant or underused properties, irregular tenements or damaged buildings, located in central areas





The diagrams above illustrate the criteria used to define each type of ZEIS.  
*Illustrations from City of Sao Paulo Strategic Master Plan, 2014, 4-5.*

### **Who initiates, develops, and monitors the entire process?**

Legally registered neighborhood associations are allowed to request the transformation of the areas they represent into a ZEIS. To begin the process, communities form a Commission for Legalization and Urbanization - COMUL (Art. 6), and elect two representatives who are responsible for negotiating with municipal government officials and making decisions in the best interests of the community over the course of two years. In addition to the two community representatives, each COMUL includes one representative from URB10, one representative from the municipal or state government agency in charge of the implementation of land development and legalization projects, and one representative of the non-governmental agency working with the neighborhood association.

After the first year of negotiations between COMULs, the ZEIS popular movement realized the necessity for a forum where all the participants of the process could discuss common problems and solutions and created the FORUM of PREZEIS (Art. 36). While COMULs center around more specific community issues, the FORUM addresses broader challenges such as the funding allocation for urbanization projects, speeding up bureaucratic procedures to institutionalize COMULs, and monitoring government spending and action (Brazilian Research Report 19-21).

### **Case Study: Recife**

“The first ZEIS property experience occurred in the city of Recife (1.3 million inhabitants) in the 1980s” (POLIS 2004). Supported by the Commission of Justice and Peace of the Archdiocese of Olinda and Recife, a bill was passed that regulated ZEIS and provided participatory management mechanisms for conducting urban recovery projects, legal settlement, and forms processing requests in locations still not characterized as ZEIS. The law also introduced protective mechanisms against speculative market shares; established minimum lot sizes; and prohibited remembramentos, or the consolidation of several neighboring lots into one bigger lot.

In 1993, the PREZEIS law and fund was approved by the City Council, with 1.2% of tax revenue to be committed to the operation of ZEIS. ZEIS results were made possible in large part because neighborhood residents organized and became permanent partners of municipal urban policy. In addition to providing access to housing for the people involved, this process demonstrated improvements in municipal administration, as the government consulted the population and fulfilled its role as a mediator of urban land disputes (POLIS 2004).

## Key Questions Raised

- Despite legal efforts to preserve affordability in ZEIS areas for low-income populations, concerns remain that the regularization of ZEIS areas will raise living costs and displace residents, thus jeopardizing the primary objective of integration (Fenandes 2003, 9).

## Implications for Other Communities

- Through the establishment of ZEIS, local governments acknowledge the right of favela dwellers to have access to urban land and housing, as well as the state's obligation to upgrade favelas (Budny 2007, 5).
- Legally, ZEIS allows municipal authorities to use instruments such as the prescription and granting of right of use and to facilitate the land regularization of the settlements.
- Recognizing favela dwellers as the subjects of rights has helped establish the initial foundations of socially oriented and participatory urban planning. Historically, ZEIS have worked better when neighborhood residents participate in the negotiations on regulatory and investment decisions. The process has also been improved by more open and democratic negotiations with real estate developers (Budny 2007, 4).
- Investments in infrastructure and urban services to support higher densities have been shown to generate increases in land values, thus increasing the municipal tax base (LILP 2013, 4).
- While the increase in land values caused by ZEIS is helpful to cities, it can lead to gentrification and displacement of low-income populations.
- Environmental results of ZEIS include improved built environment for residents and reduced risk of damage from habitation in risky areas prone to landslides or floods.
- However, the program can be interpreted as institutionalizing lower standards for those with the fewest resources (Budny 2007, 3).

## Case Study: Livable Neighborhoods Code, Perth, Australia

### Overview and Context

The Western Australian Planning Commission (WAPC) created the Livable Neighborhoods Code in an effort to guide sustainable development and reduce urban sprawl in Western Australia. The guidelines aim to produce more efficient, sustainable, and appealing developments outside of urban centers. According to the State of Western Australia, “Livable neighborhoods has been prepared to implement the objectives of the State Planning Strategy which aims to guide the sustainable development of Western Australia to 2029. Livable Neighbourhoods operates as a development control policy, or code, to facilitate the development of sustainable communities” (State of Western Australia 2007, 1).

The Livable Neighborhoods Code in Western Australia and in the Perth Metropolitan Region in particular was preceded by several efforts in other areas of Australia, including the Victorian Code for Residential Development (1992) and a Ministerial Directive to achieve 15 residential lots per hectare in South East Queensland and New South Wales (Lumb et al. 2000).

At the start of the Livable Neighborhoods initiative, the Perth Metropolitan Region had a population of approximately 1.4 million, relatively low-density residential development (about six dwellings per hectare (WAPC, 2003), and a history of urban sprawl, making it a fitting test site for the new code.

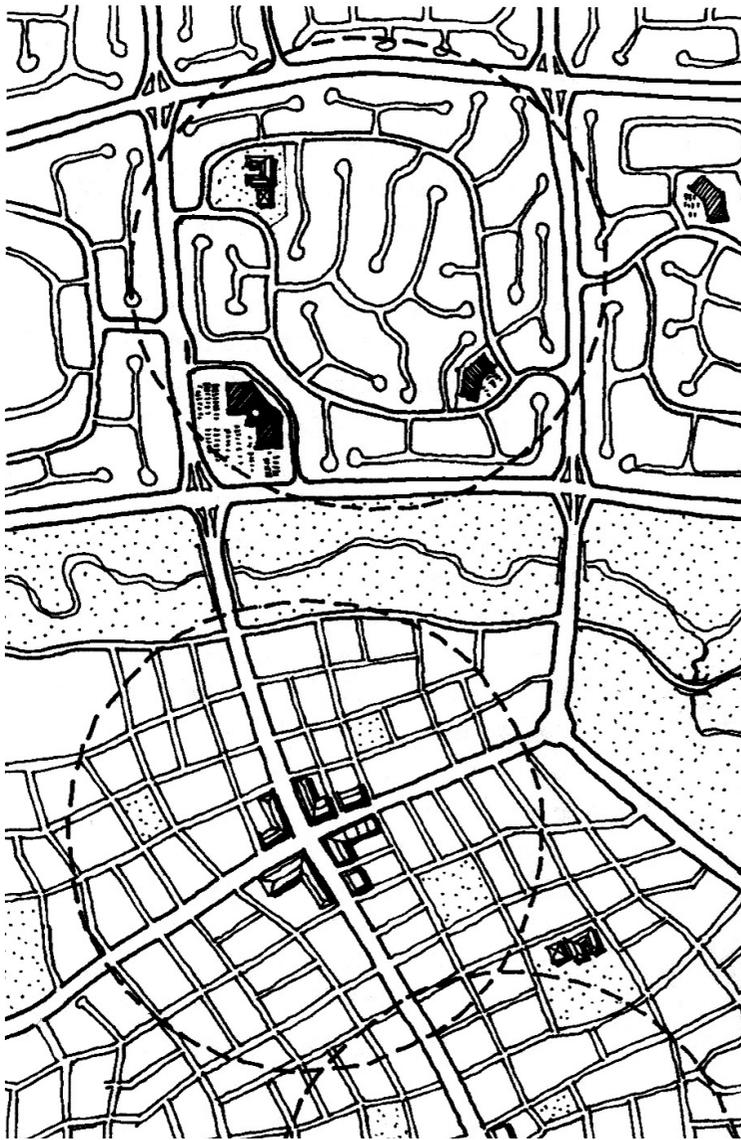
The state had an overarching goal of guiding sustainable development and also held a strong

influence over the land market. While Western Australia as a whole was working to provide adequate access to education and community services, create a stable economic base, and retain environmental quality, Perth in particular was struggling to keep up with the high cost of service provision in an rapidly expanding area. Perth also struggled with “the need for greater housing affordability, concerns about safety and security, a desire for greater social, economic, and environmental sustainability, the need for more locally-based jobs and the ability to provide public transport more efficiently” (State of Western Australia 2007, 4). Within Western Australia, the plan was to be implemented in metropolitan and country residential areas, on greenfield and urban infill sites (State of Western Australia 2007, 2).

### Project History and Current Issues

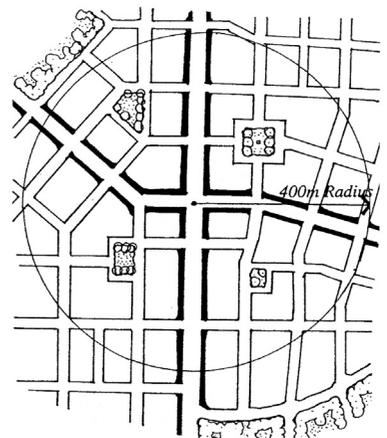
The Australian Department for Planning and Infrastructure (DPI) amended the Australian Model Code for Residential Development 1995, a “national reference document for residential developments,” in order to create the Livable Neighborhoods (State of Western Australia 2007, 3). Although the code offers guidance, it is not mandatory for developers or planners to utilize, nor did the state properly incentivize developers to comply.

The first edition of the Livable Neighborhoods (LN) Code was published late in 1997 and a 12-month trial ensued whereby developers and their designers could choose to adopt the Code as an alternative to traditional subdivision practices on large greenfield sites (Curtis and Punter 2004,



Left: The diagram illustrates difference in urban form between a conventional planning code and The Community Design Code.  
*Illustrations from Livable Neighborhoods Community Design Code 1997, 19.*

Right: Neighborhood unit based on a walking distance of 5 minutes to the center.  
*Illustrations from Livable Neighborhoods Community Design Code 1997, 21.*



38). The code offered illustrations, analyses, and guidelines to assist with subdivision development applications from large-scale to small-lot (Curtis and Punter 2004, 40), and conceived of the neighborhood as a site and device to promote sustainable development (Curtis and Punter 2004, 33). Assessment criteria include community design (site context and analysis), movement network, lot layout, public parkland, urban water management and utilities, each with separate objectives and quantitative and qualitative requirements (Curtis and Punter 2004, 40).

### Outcomes

Because of Perth's history of low-density development, the code did not set specific density targets, but promoted the development of more diverse lot sizes instead. (Curtis and Punter 2004, 49). Although the development of multiple housing units and apartments has proven successful in inner-city redevelopment areas, or coastal harbours or marinas, it has remained a risky prospect for developers at the suburban fringe (Curtis and Punter 2004, 50). The first edition of the code encouraged the development of smaller retail but has met limited success as of 2004, thus undermining the walkability objective of the LN Code (Curtis and Punter 2004, 53).

The Code sought to create 1.4 jobs per resident household to reduce commuting and increase the self-containment of development in suburbs through business and home-based business development methods. This has proven to be an optimistic projection, explained here by Curtis and Punter: "...this seems very optimistic unless significant large-scale employers can be attracted to adjacent business, distributional or industrial areas" (Curtis and Punter 2004, 53).

In general, developers have readily accepted road layout initiatives such as cyclist and pedestrian-friendly design, additional landscaping,

interconnected roadways, spine roads through neighborhood centers, and street facing lots. Developers were ultimately less accommodating to the decrease in cul-de-sacs, which were in demand from homebuyers.

### Key Questions Raised

- Can sustainable residential development patterns be effectively encouraged through planning controls and codes?
- Can community design be altered by a code that is not mandatory? What kinds of incentives work and which don't?
- Is the neighborhood the proper scale at which to target sustainable design?
- Can a general code with a "broad brush" effectively implement sustainable development in a metropolitan region?
- How can housing developers best be prepared and incentivized to build sustainably?

### Implications for Other Communities

- The code has not been widely adopted because it is seen as overly complex by developers and not in sync with the local market (Curtis and Punter 2004, 46)
- Evaluative studies have been conducted to determine the effect of the Livable Neighborhoods Code on healthy outcomes like walking; however many of them believe insufficient time has been allowed to note the effects of the new code. So far, there has not been a significant relationship (Hayley 2013, 1219).
- This project is being used as a live test of whether planning at the neighborhood level can promote healthier, more equitable, more accessible and biodiverse, and more civic forms of development. For these reasons it is worth refining it (Curtis and Punter 2004, 33).

## Case Studies: Choice Neighborhoods, USA



### Overview

Choice Neighborhoods (or Choice) is a program administered by the U.S. Department of Housing and Urban Development (HUD) that targets severely distressed public or HUD-assisted housing and surrounding neighborhoods. While public housing is owned by governments, HUD-assisted housing consists of rental housing for low- and moderate-income households that is owned and developed by for-profit and nonprofit corporations, receiving subsidies through various HUD programs, (Pendall and Hendey 2013, 1-12).

The Choice program defines severely distressed housing as that which: “requires major redesign, reconstruction, or redevelopment,” significantly contributes to the physical decline and disinvestment in the surrounding neighborhood, and “cannot be revitalized through assistance from other programs” (HUD 2014c, 11; HUD 2014d, 11). Severely distressed housing is occupied primarily by low-income families, suffers from vandalism and high crime rates, or lacks sufficient services such as transportation, schools, or support services (HUD 2014c, 11; HUD 2014d, 11).

Choice housing in Yessler Terrace project in Seattle, United States.

*Photo: Collection of Ann Forsyth*

In Choice-eligible neighborhoods, at least 20% of households must be extremely low income. In addition, one of the following characteristics should be present: high crime; high rates of vacancy or substandard homes; or inadequate schools (HUD 2014c, 13; HUD 2014d, 14). Eligible neighborhoods should be larger than the footprint of the target housing but typically smaller than two miles in diameter (HUD 2014d, 7). Applicants identify their target redevelopment site and define the extent of the surrounding neighborhood. Eligible applicants for Choice Neighborhoods planning grants include PHAs, local governments, nonprofit entities, and tribal entities. For-profit entities are also eligible for implementation grants. In the case of implementation grants, a local government unit must be either an applicant or co-applicant (HUD 2014c, 13).

### History and Key Players

Federal housing policies were first launched in the U.S. in the 1930s, supporting mortgage insurance, public housing, and housing assistance. The majority of the 1.5 million public housing units built since the 1930s are still in use today. Over time physical deterioration and social distress in the most derelict developments became notorious (Pendall and Hendeby 2013, 1-1).

In 1992, the National Commission on Severely Distressed Public Housing, established by Congress, released a report indicating that 86,000 units (6% of the public housing stock) was severely distressed (The National Commission on Severely Distressed Public Housing 1992, 2). The most severely distressed developments were characterized by: “residents living in despair and generally needing high levels of social and support services;” “physically deteriorating buildings;” and, “economically and socially distressed public buildings” (The National Commission on Severely Distressed Public Housing 1992,

3). Developments suffered from crime, obsolete mechanical systems, and high vacancy rates. Inadequate federal funding and inefficient management by housing agencies undermined maintenance and security measures in public housing (Popkin et al. 2004, 9-10). Social services and economic development opportunities were often forgotten in favor of a focus on the physical condition (The National Commission on Severely Distressed Public Housing 1992, 3-4). Notably, public housing residents were primarily low-income and minority women and children facing extreme racial and economic segregation, living in neighborhoods without access to transportation or job opportunities (Popkin et al. 2004, 8).

Following the Commission’s recommendations, the Department of Veterans Affairs and HUD created the Urban Revitalization Demonstration, later called Hope VI, of which Choice was a successor program (HUD 2014a). Hope VI emphasized the need to de-concentrate poverty by relocating public housing residents and by building mixed-income developments (Popkin et al. 2004, 14). Public Housing Authorities (PHAs) received more than \$6.3 billion (in current dollars) through Hope VI (Pendall and Hendeby 2013, 1-2 and 1-3). The program allowed PHAs to spend up to 15% of funding on community and supportive services, and involved partnerships between PHAs, city and county governments, and private-sector builders, property managers, and investors (Pendall and Hendeby 2013, 1-3 and 1-4). Hope VI was criticized for reducing the total number of public housing units, failing to target the most severely distressed housing, inadequately engaging residents, displacing residents, failing to incorporate innovative design and effective services, with limited data to evaluate program outcomes (NHLP 2002, i-iii; Popkin et al. 2004, 3). However, not all projects had these negative side effects and some revitalized neighborhoods in positive ways.

In 2010, HUD released the final round of Hope VI grants and launched Choice Neighborhoods as a successor (Pendall and Hendey 2013, 1-4). Key players and stakeholders in Choice Neighborhoods include HUD, PHAs, local governments, nonprofit entities, tribal entities, for-profit entities, residents of distressed housing, and other neighborhood residents. Like Hope VI, Choice relies on public-private partnerships for housing redevelopment.

For implementation grants, applicants are evaluated on a points system, based on the following criteria (HUD 2014c, 58). Planning grant applications are evaluated on a similar but less detailed point scale (HUD 2014d, 40). Issues include capacity of the project team, needs, neighborhood strategy, housing strategy, proposed services, and the soundness and feasibility of the approach.

Choice Neighborhoods differs from Hope VI in that it: “extends eligibility to privately owned, federally subsidized developments,” requires one-for-one unit replacement, and places greater emphasis on neighborhood revitalization (Pendall and Hendey 2013, 1-1) though a focus on three levels of impact: housing, people, and neighborhood.

## Housing

Choice supports redevelopment of both public housing and private rental housing properties subsidized through HUD’s multifamily programs (Pendall and Hendey 2013, 1-12). The program prioritizes housing that is: “energy efficient, sustainable, accessible, and free from discrimination;” “mixed income;” that is “well-managed and financially viable” (HUD 2014c, 2).

Choice requires one-for-one replacement of assisted or affordable housing units, with new units expected within the indicated neighborhood

(Pendall and Hendey 2013, 1-13). The program also stipulates that: “lease-compliant tenants have the opportunity to return to the revitalized target development” (Pendall and Hendey 2013, 1-13). Some exceptions exist, such as: replacement of up to half of units with housing vouchers in metropolitan areas where the rental housing market is already oversupplied relative to demand.

## People

Like Hope VI, Choice requires strategies for community and supportive services, early childhood education, income mixing, community engagement, relocation plans, and fair housing (Pendall and Hendey 2013, 1-14). Choice differs from Hope VI in that it places particularly strong emphasis on improving K-12 education and looks to create services that will benefit the neighborhood at large, not just residents of the redevelopment project (Pendall and Hendey 2013, 1-14).

## Neighborhoods

A central goal of Choice is to: “transform neighborhoods of poverty into functioning, sustainable mixed-income neighborhoods with appropriate services, public assets, transportation and access to jobs, and schools” (Pendall and Hendey 2013, 1-15). Grantees can allocate up to 15% of funds for Critical Community Improvements (CCIs), such as development of transit or retail opportunities, and are required to designate a lead agency for implementation of neighborhood measures (Pendall and Hendey 2013, 1-15). Choice also focuses on public safety.

## Current Issues

In total, HUD has now awarded 38 Choice planning grants and 8 implementation grants (HUD, 2014b). Planning grant applications from the first three years of Choice (FY 2010, 2011, and

2012) indicate that targeted neighborhoods vary substantially in physical size, number of housing units, and land, but have median household income below the city average (Gebhardt 2014, 8).

### Key Questions Raised

- Which kinds of projects maximize spillover effects from Choice? For example, is it better to direct funds to areas where revitalization efforts and increased investment are already occurring? Or, would changes in these areas have been just as substantial without Choice?
  - What metrics should be used to evaluate the success of Choice Neighborhoods?
  - What are best practices for delineating neighborhood boundaries? Is the flexibility Choice allows in choosing neighborhood boundaries advantageous to advancing the goals of the program?
  - Which mechanisms and entities most effectively facilitate program coordination, public-private partnerships, and leverage?
  - Do the Choice Neighborhoods projects adequately address the needs of vulnerable populations?
  - Do the Choice Neighborhoods projects lead to increased population density?
  - How effective are place-based strategies in improving services like education quality?
- at length which characteristics define a promising project site. Policy makers should also consider the appropriate scales for target housing sites and neighborhoods, as well as whether redevelopment programs should include private housing, like Choice Neighborhoods does.
- More fundamentally, there is the question of whether it is best to target neighborhoods where revitalization efforts are underway if this focus may effectively skip over the most distressed developments.
  - Programs that seek to improve housing, people, and neighborhoods may take on a wide breadth of challenges beyond housing redevelopment, from enhancing education to improving public safety or providing additional services and facilities, like transportation infrastructure and grocery stores.

### Implications for Other Communities

- Government funding may constitute a small portion of the total anticipated budget for redevelopment efforts; thus, an important consideration in housing and neighborhood revitalization is how to leverage additional funding and coordinate the many actors involved in public-private partnerships.
- Housing redevelopment can create substantial spillover effects, particularly in areas where revitalization efforts and increased investment are already occurring; however, policy makers should consider

## Case Study: BOSCO Sustainable Community, Regional Single-family Housing *Vivienda Unifamiliar Regional (INFONAVIT)*, Hermosillo, Mexico



Front view of housing units in BOSCO development, Hermosillo, Mexico.  
Source: *Derex Desarrollos*

### Overview

The BOSCO project shows an innovative design for low-rise, high-density housing in Mexico. The idea of for the project started in 2014 after the International Forum for Sustainable Housing (Foro Internacional de Vivienda Sustentable, FIVS), organized by INFONAVIT, where a group of architects presented proposals for single-family housing developments adapted to the regional conditions of each state in the country. The exhibition titled “Regional single-family housing: 32 states, 32 architects, 32 proposals” (“Vivienda Unifamiliar Regional: 32 entidades, 32 arquitectos, 32 propuestas”) reflected on the challenges and opportunities of adapting social housing to the social, cultural, and environmental contexts of the different regions in Mexico (Arquine 2015).

One of these proposals, developed by the Mexican architecture firm TAX, led by the architect Alberto Kalach, caught the attention of a regional social housing developer based in the state of Sonora. The developer, Desarrollos Derex, enthusiastic about the idea of developing



Aerial view of the BOSCO development in Hermosillo, Mexico. The map to the left shows the location of the project in the CONAVI boundaries in the city.

Source: *Derex Desarrollos*

innovative projects, was interested in determining if these new models would be financially feasible and if they would be accepted by the local consumers.

After an intense design process and revisions with the architects, the developer, and INFONAVIT, the BOSCO development materialized as an intra-urban project with a density that exceeds the typical parameters in these type of developments. In addition, through close attention to design and constant cost efficiency revisions, the price of the units were more affordable than the neighboring competition.

### Context

Since the early 2000s the Mexican housing sector experienced accelerated growth, especially in the social housing segment. Even though this growth has become an important motor of the national economy, it has also prompted a mass production system that often ignores the specificities of the local context such as topography, climate, materials, culture, and lifestyle.

Recognizing that the greatest challenge is not only to provide mortgages for workers but also to provide quality of life, INFONAVIT has been developing strategies to ensure that houses are adapted to local characteristics. To achieve these aims, the Sustainability Department (Subdirección General de Sustentabilidad) at INFONAVIT has been responsible for coordinating with developers, architects, and local authorities to materialize innovative projects such as BOSCO.

At the same time, in the case of BOSCO, the developer has played a crucial part in the process. For instance, Derex participated in 2009 in the NAMA program, a research collaboration between the Mexican and German governments, to analyze materials and construction systems to reduce CO<sub>2</sub> emissions and energy consumption in the homebuilding process.

### Project History and Current Issues

The main challenge was to ensure that affordable social housing could be built in a well-located area, despite higher land costs. To address this



BOSCO units (shown below) have 48% more interior space than the previous models built by the developer (shown above). Similarly, the BOSCO development is better located, closer to urban amenities than other development built by the developer.

Source: *Derex Desarrollos*

issue, the developer knew that changes in the local permits to allow more density and design strategies would be key to keep prices low without compromising quality.

The prototype proposed by TAX was able to accommodate 120 units per hectare, a density greater than the typical density in these types of developments, roughly 100 units per hectare, and more than what the developer had already achieved in a neighboring site (80 units per hectare).

Another objective of the project was to maximize the interior space and offer a parking spot with each house. The developer advocated these requirements based on their experience in the city and certainty that the project would not be commercially attractive without these characteristics.

In terms of the size of the unit, the new prototype achieved 73 square meters. This exceeds the size of other similar products by the developer, averaging 49 square meters. A remarkable 48% increase in the interior size was achieved with a minimal price difference. The use of local materials and innovative construction systems kept prices down.

As of February 2016, the developer reported that sales have been very positive, and they expect to replicate this project in other cities. Even though the project involved a strong commitment from multiple actors, an

intense review period, and trial and error process, its example demonstrates that it is nonetheless possible to build affordable social housing that is well located, dense, well serviced, adapted to local contexts, and still financially feasible for the developer.

The graph shows a comparative analysis of the unit size, price, and location of the products that the developer offers. It is clear that BOSCO offers the best price-product ratio without compromising location, construction quality, or urban amenities.

### Key Questions Raised

- What strategies can be used to incentivize other developers to develop projects like BOSCO?
- How can other institutions and actors collaborate on these types of developments?
- How can neighboring communities and

users participate in the design process?

- How can these developments be reproduced in other areas of Mexico?

### Implications for Other Communities

Projects like BOSCO are important because they provide an example that it is indeed possible to do sustainable projects, in good locations, and be financially successful.

As Mexico is a very diverse country, it is essential that housing design and production be based in the realities of the local context. Adapting to these particularities will ensure the long term quality of life for the residents.

During the design process, flexibility can be built in to determine the density adequate for the local context.

CITY | NOGALES

PRODUCT	POLIGON	SQM	LOCATION	HOUSING PRICE PER SQM
A	DUIS	46	4	5,869
A	DUIS	51	4	5,890
A	U3	49	3	6,655
B1	U2	62	2	7,729
MEDIA	U1	70	1	9,094

CITY | TIJUANA

PRODUCT	POLIGON	SQM	LOCATION	HOUSING PRICE PER SQM
A	U3	51	3	6,786
B1	U3	60	3	7,181
B1	U3	59	3	7,743
MEDIA	U2	61	2	11,637

CITY | HERMOSILLO

PRODUCT	POLIGON	SQM	LOCATION	HOUSING PRICE PER SQM
A	U2	49	2	7,996
B2	U3	70	3	7,470
MEDIA	U3	88	3	6,809
MEDIA	U1	88	1	8,848

CITY | BOSCO

A	U2	73	2	6,027
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\*More housing units  
 \*include parking space and green roof  
 \*NAMA efficiency level B

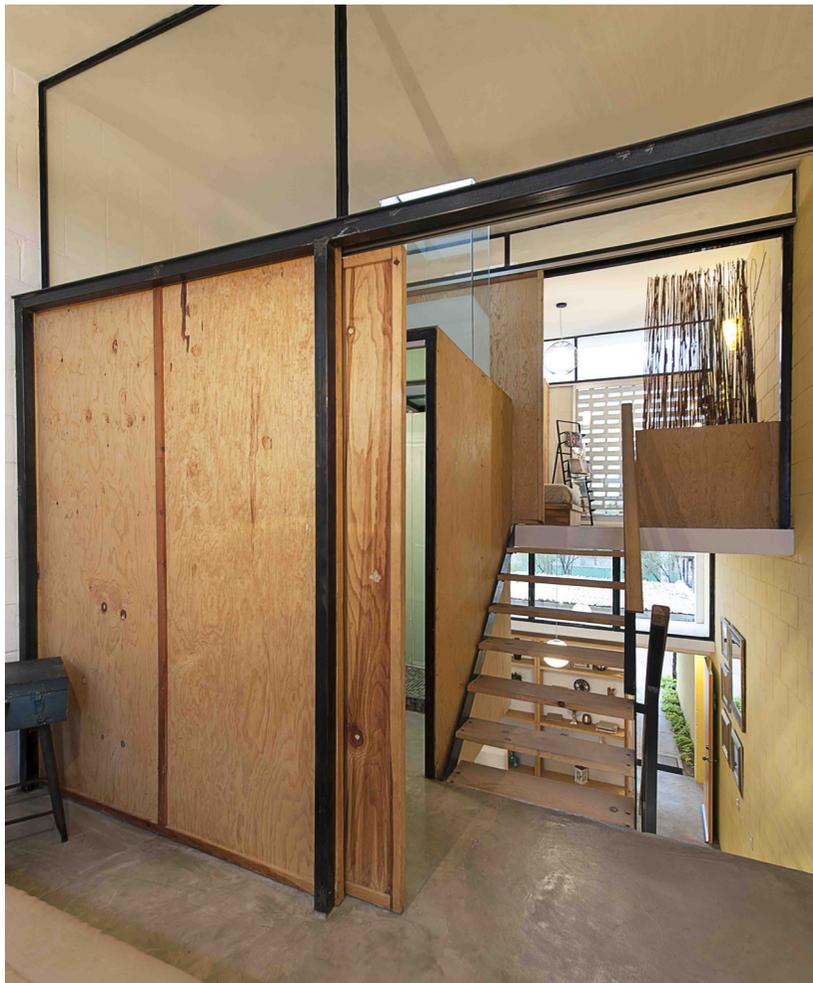


Cost analysis of different developments built by Derox Desarrollos. The graph shows that compared to other products of the developer, despite land costs, the BOSCO development achieved a lower price per unit and a larger unit size.

Source: Derox Desarrollos



Floor plans of a BOSCO unit and view from the backyard.  
 Source: Derox Desarrollos



Interior view of a BOSCO housing unit.  
 Source: Derox Desarrollos