# Planning Sustainable Cities and Regions

## Towards More Equitable Development

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# 9 The Challenge of Mixing Uses and the Secret Sauce of Urban Industrial Land

The UC-Berkeley hall was packed with local officials and grad students eager to hear Bruce Katz, Vice President of the Brookings Institution, pitch his new book, *The Metropolitan Revolution*. Key to the revolution is the innovation district: "Innovation Districts cluster and connect leading edge anchor institutions and cutting-edge innovative firms with supporting and spin off companies, business incubators, mixed-use housing, office and retail and 21st century amenities and transport" (Katz and Bradley 2013: 114). For instance, the 22@Barcelona mixed-use innovation district is redeveloping a 200-acre industrial area as a cluster of media, medical technologies, information technology, energy, and design businesses, along with housing, retail, and parks.

A planner from the City of Oakland raised her hand. "You've described this innovation district in Barcelona that shifted zoning from industrial to mixed use. We've discussed that for West Oakland, too—we have some similar businesses to Barcelona. But what we can't figure out is, what happens when the new businesses in IT can pay more for rent and the existing manufacturers get pushed out? You can't sustain the mix." Katz explained that Barcelona was a little different from the United States because of all the public funding available to finance infrastructure and development. But the question about industrial displacement and the impermanence of mixed use was just too tough to tackle.

Even if the theories of regional and sustainable economic development outlined in previous chapters suggest we should foster existing industrial businesses, why should we protect those in the region's core? The line of argument typically put forward by the local Chamber of Commerce is that these businesses are mostly heavy manufacturers who have been leaving the city for decades anyway, or distributors who are using the land inefficiently, mostly for parking. With resistance to infill development in urban neighborhoods, and high land costs downtown, the industrial land near the core becomes the low-hanging fruit for developers.

Often, an odd growth machine coalition in support of converting industrial land emerges, armed with ideas such as innovation districts. This might include not just the Chamber and developers, but nonprofit housing developers concerned about the need for affordable or workforce housing downtown,

planners interested in more housing to achieve jobs–housing balance, politicians seeking retail and the sales tax revenue it brings, environmental justice advocates concerned about pollution from productive businesses in high-density areas, and economists advocating export-based regional growth based on high-tech.

At the same time, a broad movement is supporting the preservation of industrial land in the urban core of regions across the country. Driving the movement are organizations working to preserve and promote urban manufacturing, such as the Urban Manufacturing Alliance, as well as entrepreneurial city agencies. They share the recognition that industrial businesses (or, more broadly, production, distribution, and repair firms) support both the residential sector and other businesses, that they need to be located close by their customers downtown, and that the availability of affordable land is key to maintaining these businesses (Dempwolf 2010). These businesses play a vital role in the local economy, but are almost invisible.

San Francisco, where ongoing pressure for rezoning to residential has diminished its industrial land supply to just 4.5 percent of its land (from 14 percent in 1948), provides many great examples of the interconnectedness of its industrial and commercial districts. When the San Francisco Opera, located in the Civic Center, incurs damage to a tree on its set in the middle of a performance, how does it get a replacement? Its own building is too small to store its sets, but it needs them nearby for rapid access. So, it has a storage warehouse just minutes away in the Potrero industrial district. A civic use such as the opera cannot afford storage space in the urban center, but it can maintain trucks to fetch props in an emergency.

And there are other equity-related reasons to support industrial land as well, ranging from its positive fiscal impacts to the high-quality jobs it provides, often for local residents. Cities often turn to mixed-use (or now, innovation) districts as a compromise that will accommodate the different interests. But that diversity is not sustainable.

## The Tension Between Mixed-Use and Industrial Land

In the industrial city, industrial land is typically located near the urban core, for easy transport of goods and access to labor. Over time, competing uses, such as office and high-end residential, that could pay more for centrally located land, outbid industrial uses, and these businesses moved out. Still, many core industrial districts remained intact, particularly if they were located on less desirable land, next to railroad tracks or freeways that prevented direct access to the central business district. By the 1970s, many of the industrial businesses had departed for the suburbs or overseas. Thus, when artists, young families, and soon, investors, began seeking out unique live-work spaces in non-residential areas, they quickly gravitated toward these neighborhoods. Their transition to mixed use was part of a larger trend.

### *The Advent of Mixed-Use Districts*

Most credit Jane Jacobs with illustrating most effectively the value of mixing uses. Her critique of urban renewal contrasted single-use residential tower superblocks with the vibrancy of blocks containing a fine-grained mix of diverse uses. But in reality, most North American cities relied on an entrenched system of single-use zoning that would prove hard to modify. The 1917 Zoning Code in New York City had introduced the notion of the hierarchical zone—with housing at the top, then commercial, then industrial—and little or no mixing in order to protect higher uses. These reflect societal ideals of order and privacy, with homogeneous residential districts placed at a distance from the chaos of commercial development (Boyer 1983; Hirt 2007; Perin 1977). Arguably, these single-use districts subsequently shaped not only American culture, but also its construction industry, which separated into home builders, office developers, retail developers, and industrial developers (Hirt 2007). This, then, made it more expensive to construct developments that would mix uses.

By the 1980s, community acceptance of mixed use had grown, to the point where today a majority (53 percent) of U.S. residents prefer to live close to restaurants, shops, and offices (Urban Land Institute 2013). From the 1980s to today, mixed use gradually became integrated into planning (Grant 2002). Cities have modified zoning regulations to permit and intensify the mixture of uses—residential, commercial, open space, institutional, and, less frequently, industrial (ibid.). New Urbanists, particularly its transit-oriented development advocates, are strong proponents of mixed use for sustainability reasons, citing its ability to maximize efficient use of infrastructure and reduce VMT through collocation of diverse uses (ibid.). Proponents of traditional neighborhood design focus more on its impacts on the quality of life, with the mixing of home and work in the dense and diverse European city as their model (Foord 2010). But even planners who have embraced mixed use see challenges in including industrial businesses in the mix (Grant 2002).

Mixed-use proponents generally support both horizontal mixed use (i.e., walkable clusters of different uses) and vertical mixed use (i.e., a mixture within a specific building or development). The ideal is to mix at the finest grain possible, what Constance Perin (1977) called the "bathtub in the kitchen"—though even advocates admit that it may be challenging to generate market demand (Ewing 1996). But the context also shapes the character of mixed use: a vertically mixed-use development within a single-use district may not be particularly vibrant, while a horizontally mixed-use district may also not be very lively if different types of uses are dispersed and not within a short walking distance.

Despite the gradual institutionalization of mixed-use zoning codes, in practice, communities do not always embrace them. NIMBYism, the not-in-my-backyard movement, often occurs in response to attempts to mixed use in residential areas by adding public facilities or high-density housing (or even parks!) (Grant 2002). The benefits of mixed-use communities are clearer for workers


*Figure 9.1* Industrial district, Oakland
*Photo credit:* Katherine Rife

in high-consumption lifestyles than, say, families with children, which might benefit more from socially cohesive communities (Foord 2010). Retail, restaurants, and nightlife can create impacts (or "negative externalities") such as noise and trash that make life challenging for local residents (Foord 2010). Even if community residents prefer mixed-use in principle, they have not yet proved willing to get out of their cars. As Jill Grant and Katherine Perrott (2011: 192) point out: "The kinds of cultural changes necessary to save the café and transform the retail landscape of suburbia into an urban form require more than mixed-use policies can deliver."

The greatest implementation challenges for both mixed-use developments and districts lie in the market. Although multiple examples of successful large-scale mixed-use developments now exist, they are still relatively high risk. The legacy of separate commercial and residential construction industries means that mixed use requires collaboration, incurring new costs. Residential and retail components may have different leasing requirements, and project phasing can also bring complications, since the retail needs the residential population to be established for it to survive (Grant and Perrott 2011). As high ground-floor retail vacancy rates attest, mixed-use requirements have led to an oversupply of retail space (Foord 2010; Grant and Perrott 2011). Large chain stores and Internet retail have absorbed much of the mom-and-pop market, and even if gentrifying neighborhoods bring new markets for boutique small-format retail, the market is generally slow to respond to neighborhood change (Chapple and Jacobus 2009; Grant and Perrott 2011). At the district scale, increasing the mix can paradoxically also decrease diversity, particularly in formerly industrial areas: as residential and commercial uses paying higher rent move in, existing industrial users will gradually be displaced (Grant and Perrott 2011).

### *Industrial Districts: To Mix or Not to Mix*

What type of district helps industrial users thrive? In principle, we might encourage zoning land to exclusively industrial use for two reasons. Hierarchical

zoning, separating lower (agricultural, industrial) uses from higher (commercial, residential), prevents the impacts of production from affecting other, less noxious uses. Zoning can also help the market understand the land's highest and best use, or the types of development that would be most appropriate (and able to pay rent) on the site.

The problem is that zoning designations often remain in place while the market shifts, and zoning can be very hard to change. Since it may appear to be obsolete, pressure builds on cities to revisit its designations. Across the United States, over 20 municipalities and counties have recently undertaken studies of industrial land supply, typically in response to developer pressures to convert the land to residential, commercial, or mixed use. It is mostly the strong market regions that are re-evaluating how much industrial land they need.

As studies show, industrial areas contribute to the regional economy in multiple ways: as job and tax revenue generators; providers of supplies and services, such as back-office functions or automobile repair, to businesses and households; and reservoirs of low-cost space that can incubate start-up businesses (Howland 2011). Land that generates employment, whether in industrial or commercial uses, tends to have net positive fiscal benefits (Strategic Economics 2004). Many sites house large buildings with potentially flexible use: many industrial sites can accommodate not just production, but also back-office functions, storage, loading, parking, and even research and development (Figures 9.1 and 9.2). They can also be subdivided when firms decrease in size. In contrast to more modern office buildings, this type of space offers firms the flexibility they seek in today's economy, with the ability to shift between vertical and horizontal organization, and to easily add or shed employees.

More recently, advocates for the preservation of industrial land have argued that this land is most likely to support the coveted middle-skill jobs. Production, distribution, and repair (PDR) businesses locate in many different types of buildings on industrial land and typically provide jobs in industries that pay well over a living wage, such as auto repair, construction, landscaping, and utilities (San Francisco Planning Department 2002). The rise of sustainable and

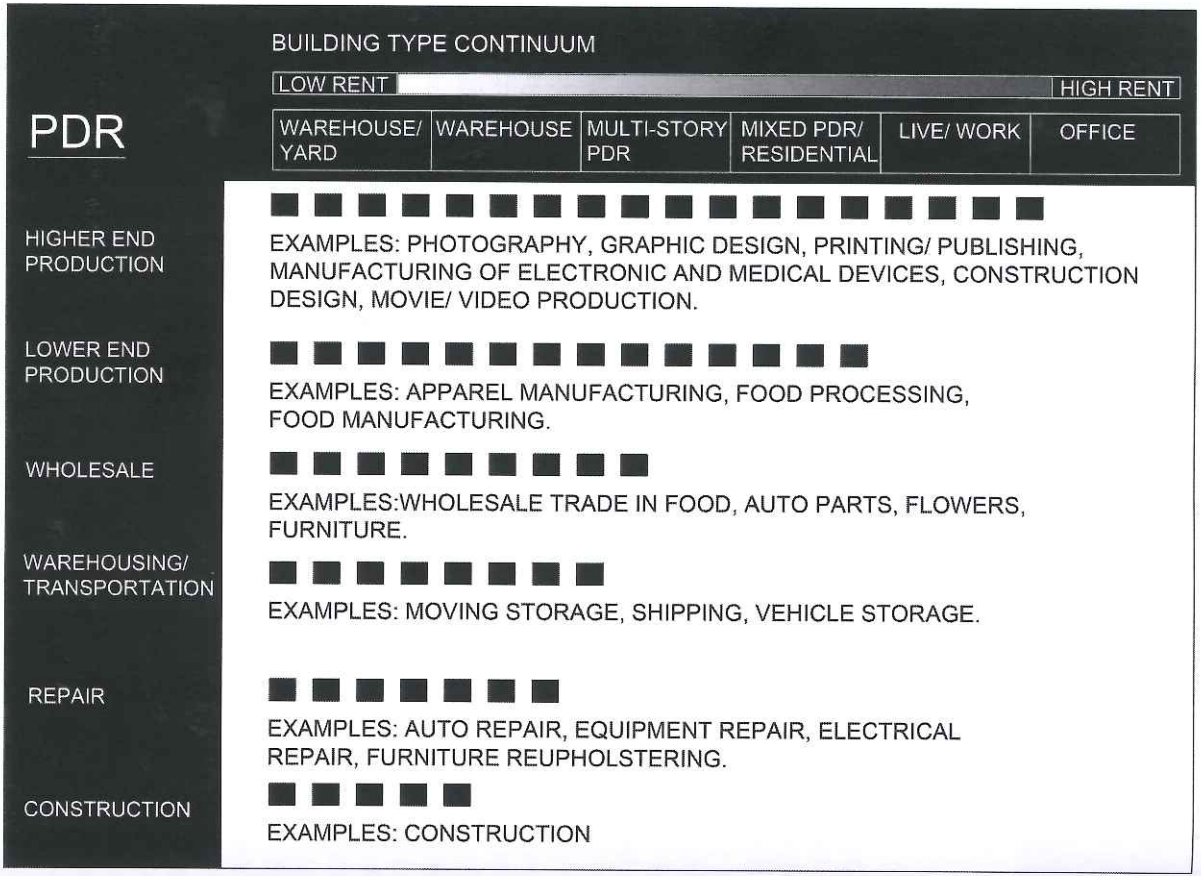


*Figure 9.2* Businesses and building types on industrial land

Source: Adapted from San Francisco Planning Department (2002)

niche manufacturing, along with the relatively strong performance of manufacturing during the economic recovery—due largely to changing production costs (rising transportation costs, falling energy costs), a weak dollar, and competitive wages—has suggested the continued importance of industrial zoning in the core (Christopherson 2011).

The location of production, distribution, and repair businesses within the region also has important implications for smart growth and regional sustainability (Leigh and Hoelzel 2012). Locating logistics businesses in particular (e.g., wholesale distributors) in the urban core, near major trading ports, helps ensure the efficient movement of goods. Displacing these firms from the core into peripheral areas—a trend that is already occurring—would mean a significant increase in VMT from trucks (Hausrath Economics Group and Cambridge Systematics 2008).

However, critics continue to raise the issue of inefficiency, arguing that the benefits are not high enough to warrant the cost to the city of subsidizing the land. From their perspective, policies that slow the relocation of these businesses to more appropriate areas may actually impede regional economic growth (Hills and Schleicher 2011). Moreover, rezoning to the highest and best use—often thought to be commercial office or apartment buildings—might yield higher returns in terms of business attraction and local tax revenues—with these higher density uses more likely to be occupied by transit users. And in many cities, "industrial chic" is valued for its potential to attract innovative entrepreneurs—the fabric of these new innovation districts of the "metropolitan revolution."

Not surprisingly, council meetings over the rezoning of industrial land attract hundreds of stakeholders on both sides of the issue. The battle is playing out in New York City, Boston, San Francisco, Chicago, Los Angeles, Denver, Baltimore, Minneapolis, Charlotte, Portland, Seattle, much of the DC metropolitan area, and many other smaller cities. How can we bolster the regional sustainability argument for preserving industrial land?

## The Secret Sauce of Messy Industrial Land

**Support Integrity of Industrial Zones**
**for Industry, Artisans, & Artists**
**Support Housing In Allowable, Mixed Use Residential & S.Pablo Zones,**
**NOT Industrial Zones Where City Admits Housing Pressures Industry**
**& Arts OUT**
**ʃʃʃʃʃʃʃʃʃʃʃ**
**Nation, Obama Support Manufacturing Renaissance While**
**City Proposes 1,304+ residential units in Mixed Use Light Industrial**
**Zone**

West Berkeley Artisans and Industrial Companies (WEBAIC) Newsletter (WEBAIC 2012)

WEBAIC's plea to save crafts manufacturing from an influx of high-end residential could have come from any of these strong-market regions: residential

buildings bring in new residents, and new retail and residential construction and conversion follow. Given the shortage of land and the perceived chic of much of the industrial building stock, this raises rents and may displace long-standing PDR users. The city looks at the district and sees underutilized land and obsolete buildings where WEBAIC sees a renaissance. Even Enrico Moretti (2012: 175) has weighed in: "One of the most extreme cases is the city of Berkeley, which in an effort to protect 'good blue-collar jobs' has effectively stunted high-tech growth in the entire west side of the city." Is this vibrant local economy invisible to the experts?

The East Bay of the San Francisco Bay Area, specifically Oakland, Berkeley, Richmond, and Emeryville, early developed its own distinct and diversified economy, with strengths in transport, logistics, and manufacturing located on its abundant waterfront industrial land. Despite the decline and decentralization of goods-producing industries throughout the latter half of the twentieth century, the cities still maintained steady rates of growth and job creation, mostly through a rapid transition to a service economy with niches in healthcare and education, but also via steady employment in small PDR businesses, typically housed in aging industrial buildings. Growth in recent decades has put pressure on industrial landowners to convert prime areas along the waterfront to residential and office uses, despite vacancy rates of just 5 percent. Overall, 38 percent of industrial land in the region is already planned for new office, residential, or mixed uses (Hausrath Economics Group and Cambridge Systematics 2008).

The East Bay economy has about 400,000 jobs, and the majority of its businesses (83 percent) are located in its commercial and residential zones. It gets

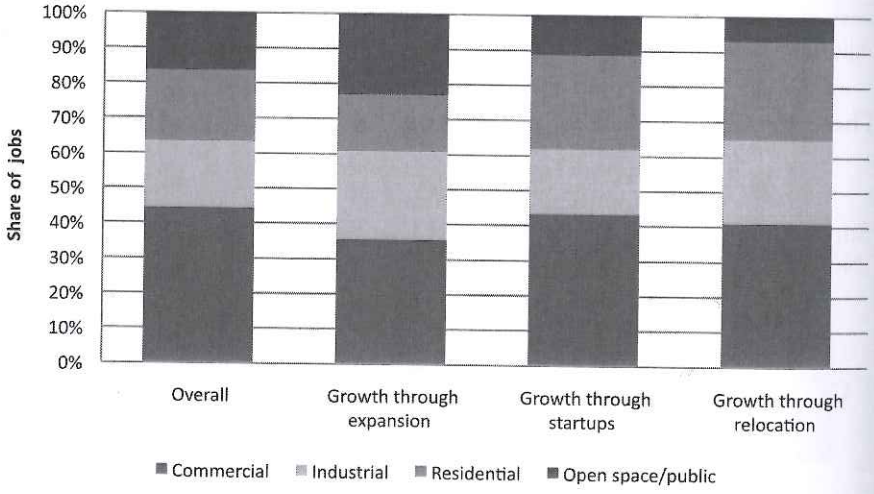


*Figure* 9.3 Jobs by zone in the East Bay: start-ups versus expansions versus relocations
*Source*: Author's calculations

much of its dynamism from start-ups and small firms, as the studies have found for other areas: in recent decades, about 45 percent of net new jobs in a given year come from new firms, and overall, 94 percent of firms have fewer than 20 employees. These start-ups most often are in high-end services such as professional, scientific, and technical services or information. Jobs from start-ups are disproportionately concentrated in residential zones (not surprisingly, as many firms start up at home) (Figure 9.3).

However, over half of net new jobs come from existing firms expanding, and businesses in the industrial zones, no matter what the sector (both PDR and services), are much more likely to expand than those in other zones, adding employees at four times the rate of commercial zones and nine times the rate in residential zones.[1] Residential and industrial land also gains disproportionately from firm relocations into the region, though these accounted only for about 5 percent of net new jobs in the region each year.

What lies behind firm expansion? Factors internal to the firm, particular mergers and acquisitions, of course play an important role, but these are hard to measure with secondary data (Brouwer, Mariotti, and van Ommeren 2004). So, let us look instead at local factors and firm characteristics. No matter what industry sector a firm is in, which neighborhood it is located in, or where the economy is in the business cycle, three factors predict job creation by existing firms: firm size (measured in terms of both employees and sales), building square footage, and industrial zoning.

Firm size matters: in other words, the smaller a firm is in terms of employment at the initial point in time, and the larger its sales, the more likely it is to expand. Thus, there is an inverse relationship between firm employment and sales: firms with high sales but low employment tend to expand (i.e., they are "gazelles"), while those with both high sales and employment are more static or actually losing jobs.

But most importantly, these results suggest the importance of actual sites—location on industrially zoned land, regardless of neighborhoods, in a relatively large building. While start-ups, as low-overhead, home-based businesses, benefit from the ability to locate in residential zones, firms that expand—whether in production, distribution, and repair or information-based services—need the flexibility to spill into available space in large buildings. Industrial zones seem to facilitate this slightly more effectively than commercial zones, perhaps because they have more of the "flex" space that allows firms to grow and shrink readily (Figure 9.4). Confirming this finding, a related survey of 88 firms in the East Bay found that when businesses are expanding, office firms are more likely to move all operations to a larger site, while industrial uses either acquire more square footage at their current site or increase their hours of operation. The major barriers to creating new jobs are labor costs, space costs, and access to capital (Meigs and Wiles 2010).

Industrially zoned land comprises just a small share of the region, typically around 10 percent. But it plays an outsize role because its low cost and flexible set-up allows firms to experiment, to shift focus from production, to distribution,

*Figure 9.4* "Messy" industrial space in West Berkeley
*Photo credit*: Karen Chapple

to R&D as need be. Once firms reach a certain size, they might move some operations: management can work downtown, and production can take place in another country. But most do not reach that size, and in fact, most add and subtract jobs several times during their lifespan. This type of space makes it possible—and invisible. Rather than stunting high-tech growth, these low-cost districts are indirectly supporting it, by providing this messy space. Meanwhile, the high-tech businesses can still locate in transit-friendly locations with the amenities that creative workers covet.

The pressure on industrial land occurs because of its location, predominantly near the core. This is not just a result of historic development patterns, but also of the need for goods movement. Many of the PDR businesses—from construction support, to manufacturing, to wholesale—depend on the region's ports and highways to support frequent freight trips. But although demand from these businesses is steady or growing, the amount of warehouse and manufacturing space in central areas is declining: in a recent five-year period in the East Bay, about 7 percent of building space was lost or converted (Hausrath Economics Group and Cambridge Systematics 2008). With land use plans already in place calling for reuse of much remaining industrial land, cities are no longer maintaining the infrastructure in many of these older areas (ibid.). Even if this land remains industrial, the supply will still be insufficient to house demand by 2035 (ibid.). This will cause many PDR businesses to shift

location to the region's periphery, or even adjacent lower-cost regions (in this case, the Central Valley), with increasing VMT and its implications for greenhouse gas emissions.

Strong market regions around the world are losing their messy industrial land near the core to office, residential, and mixed-use development—often in the name of creating new innovation districts. The idea of cross-fertilization between sectors, as in the Barcelona case, is exciting and may well yield interesting new ideas. But most innovation does not occur in cafés in expensive new mixed-use districts; the garage where HP started is a much more accurate image of Silicon Valley. Innovation is not just about developing new ideas or scientific discoveries, but introducing them into the marketplace or implementing them into production processes. It is thus highly experimental and variable. In spatial terms, it benefits from low land costs and sites that permit different business configurations, but also proximity to inputs and markets. For businesses that are just starting up or expanding, redeveloped space in a branded mixed-use innovation district brings a premature formality—quite different from the bathtub in the kitchen. Thus, how can we preserve the existing messy, but productive spaces?

## Policy and Planning

Industrially zoned land contributes to the regional economy by providing flexibility, specifically offering a reserve of relatively large sites that accommodate uses from storage to R&D. But many cities have opened up their industrial land to a variety of uses, including commercial and residential, risking unsustainable rent increases that will gradually displace PDR businesses. Other cities, while preserving their land as industrial zones, open it up to many types of industrial users. In the face of competition for land from higher rent-paying office uses, rents will escalate beyond the means of some of the firms that are contributing more jobs to the economy.

Policy recommendations for the preservation of industrially zoned land generally follow three tactics: regulation, penalties, and incentives. Regulatory tools are the most powerful; they include restricting the types of uses that can locate within a zone, instituting criteria for land conversion, and rezoning land.

Policies that preserve industrial zoning are essential "exclusionary zoning"; they prohibit higher uses despite market interest (Heikkila and Hutton 1986). This policy has costs, in that it may mean inefficient use of resources, slowdown of the transition away from industrial uses, and impacts on the local tax base in ways that are rarely made explicit. However, it may be appropriate to pursue exclusionary zoning under certain conditions, in particular: (1) when the industrial district is economically viable, functioning as a business incubator or housing businesses linked to other local clusters; (2) when there is a high level of structural unemployment; or (3) negative externalities are an issue (ibid.). Exclusionary zoning can not only keep rents low for businesses, but also provides certainty to developers about city intentions.


*Figure 9.5* New live-work lofts in mixed-use industrial zone, south of Market neighborhood, San Francisco

*Photo credit:* Arjiit Sen

In practice, exclusionary zoning for industrial use has existed in a few cities since the 1980s, due to fears that demand from commercial and residential uses was displacing viable industrial businesses (Fitzgerald and Leigh 2002). Some of these districts—called Planned Manufacturing Districts in Chicago, Industrial Protection Zones in San Francisco, and Industrial Business Zones in New York—permit the mixture of uses in the districts, but limit land availability for non-industrial users.

The case of San Francisco is notable for defining PDR so narrowly as to exclude office, which includes new media businesses. In the late 1990s, almost 2,800 acres, or 12.6 percent of land in the city, was available for industrial use—though in reality, this included the port and buffer zones where most businesses cannot locate, so the total was closer to 5 percent. In any case, zoning in most of these areas allowed various types of office and, with a conditional use permit, housing, as well as, of course, heavy and light industrial and commercial. Housing moved into industrial areas, the "Eastern Neighborhoods," because it was cheaper to build, there was less neighborhood opposition, and the zoning permitted it. At the same time, tech start-ups were attracted to the low-cost, flexible space. As developers built live-work lofts in the area (Figure 9.5), mostly for a market interested more in living in a chic industrial area than actually producing anything, businesses were displaced and jobs lost. Meanwhile, the new residents complained about the lack of neighborhood services and the nuisances and noise from the PDR firms.

But in the 2000s, after a public planning process, the city acted to preserve its industrial land. To accommodate housing, it ceded over half of its industrial

land near downtown to mixed-use zoning, with housing, and preserved the rest in industrial protection zones. The most transit-accessible areas were opened up to a variety of uses, but a short distance away, still within a mile of the downtown, the city protects its PDR uses. To maintain the dynamism of industrial districts, which often provide valuable low-cost incubator space, these zones also encourage start-up firms, but only in a few industry sectors such as cleantech and digital media, and only in lab, not office, space.

Another zoning tool currently in vogue is form-based zoning. These codes regulate urban form, rather than land use, detailing requirements for both buildings and the surrounding built environment (Woodward 2013). By controlling form, rather than use, the zoning allows the market to select the optimal user for the space. Despite the buzz, however, very few cities have enacted form-based codes (Hirt 2013). And by lifting use restrictions, this form of zoning actually threatens industrial use: if a developer were to build an industrial-style building, it might attract higher-end users who appreciate the industrial chic—and can outbid true industrial users for the space.

Key among incentives for industrial land preservation is the industrial land trust or bank, an approach in which the public sector acquires industrially zoned land and leases it to qualifying uses; examples include the Marine Industrial Park in Boston, the Brooklyn Navy Yard, and the Cleveland Industrial-Commercial Land Bank (Hausrath Economics Group and Cambridge Systematics 2004). Other specific incentives may include brownfield remediation or site assembly.

## Industrial Land Preservation as a Regional Sustainability Strategy

Older industrial areas near the urban core are coveted by non-industrial users because of their proximity to the center and their built fabric. The pressures to convert core industrial land occur because of higher land prices at the center—a phenomenon that even occurs in "donut-hole" metros such as Detroit as they are hollowing out.

From a regional sustainability and equity perspective, there are several key reasons to preserve this land for PDR uses. Low-cost land permits firms to add jobs faster, and often the jobs are of higher quality, paying a living wage. Letting industrial uses locate near the core reduces truck VMT.

What, then, of the innovation district? There is probably room for both in our cities, as San Francisco has shown. Redeveloped areas of the district, preferably those nearer to transit, could house the creative high-end firms that comprise today's urban innovators, using either form-based or permissive mixed-use zoning. If PDR users are displaced, developers can be required to replace the square footage. At a short distance away would be the messy low-cost land preserved in exclusionary industrial zones. And zoning, that much-maligned tool of planners, can make all this possible.

## Note

1. Over each three-year period from 1995 to 2008, they added an average of 0.72 employees, compared to 0.19 in commercial zones and 0.08 in residential zones. For more detail, see Chapple (forthcoming).

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