

NBER WORKING PAPER SERIES

ZONING AND SEGREGATION IN URBAN ECONOMIC HISTORY

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Working Paper 28351
<http://www.nber.org/papers/w28351>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
January 2021

We thank Daniel McMillen and Ryan Gallagher for great conversations over the years on the topic of land use regulation. We also gratefully acknowledge William Fischel, whose work has shaped our thinking on the history of zoning. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 28351
January 2021
JEL No. J15,N42,R52

ABSTRACT

Recent work has argued that zoning is responsible for racial segregation, disparities in public goods provision, growing regional inequality, and exploding housing costs in productive areas. However, the slow-moving nature of land regulation's effects suggests a crucial need for historical perspective to understand how zoning has shaped cities over the long term. This essay places the introduction of zoning in the broader context of urban development in the early twentieth century, with a focus on how the demand for separation of racial groups influenced some of the earliest zoning ordinances in American cities. We also discuss the long-run impact of zoning on the development of cities and highlight the key gaps in our understanding of the role of urban and suburban zoning in fostering segregation within cities and across metropolitan areas. A key lesson from our work in this area is that racial dimensions are important when studying land use regulations, even when the policies in question are ostensibly race neutral.

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Recent work has argued that zoning is responsible for racial segregation, disparities in public goods provision, growing regional inequality, and housing costs that are artificially high in productive areas (Trounstine, 2018; Ganong and Shoag, 2017; Hsieh and Moretti, 2019). Largely missing from this current debate is a historical perspective on how zoning has shaped cities over the long run. Yet the slow-moving nature of land regulation's effects suggests a crucial need for just such a perspective. To this end, our essay places the introduction of zoning in the broader context of urban development in the early twentieth century, with a focus on how the demand for separation of racial groups influenced some of the earliest zoning ordinances in American cities.

We begin by describing the state of land use controls prior to the spread of modern-day zoning and then turn to the development of explicitly racial zoning ordinances in America's southern and border cities during the 1910s. These segregation laws – which established “black” and “white” city blocks – were quickly struck down by the Supreme Court in the 1917 case *Buchanan v. Warley*. The years immediately following the *Buchanan* decision saw the nationwide spread of “comprehensive” zoning ordinances, which we consider in turn. Such ordinances were the precursors of current zoning laws and covered both land use and building density. While discussion of race was explicitly absent in them, they were adopted during a time when demand for racial segregation was on the rise. Given racial attitudes at the time, it is natural to question whether these ordinances were in fact racially neutral, either in impact or intent. To this point, we review our previous work on the introduction of comprehensive zoning in Chicago and Seattle, which finds that while race-neutral in language, these ordinances were implemented in both a racially and ethnically discriminatory fashion. We then turn to the long-run impacts of these early zoning ordinances on the location of economic activity. Looking

across almost an entire century, we find that they had sizable impacts on the spatial distribution of future development in these cities.

Finally, we close our essay by discussing the relationship between zoning and segregation in the postwar era, which saw accelerating black migration into cities, and, after 1970, an explosion of stringent regulations on the building of housing, particularly in the newly developing suburbs. While this later wave of zoning has received more attention from economists and policymakers, research on the topic has often failed to establish a clear causal link between zoning and segregation. We argue that future work should seek to understand the potential role played by this new urban and suburban zoning in promoting segregation and divestment, both in the urban core and at the broader regional level. Crucially related, and perhaps less well understood, are the motivations underlying the adoption of zoning ordinances by municipalities over the twentieth century. We believe that disentangling racist intent from disparate impacts that arise from race-neutral policy imperatives is central to our understanding of the origins of land use regulation. A complete picture of the causes and consequences of comprehensive zoning ordinances thus requires a long-term view that is intentional in its consideration of race.

The Landscape before Comprehensive Zoning in the United States

Managing spillovers from incompatible land uses has posed a challenge for as long as there have been cities.² Formal land use regulation in the United States began during colonial times, with rules for the enclosure of agricultural land and the management of riparian rights appearing as early as 1634 (Hart, 1996). Explicit restrictions on the allowable locations of

² For instance, see Hakim (2001) for a discussion of very early building codes in sixth-century Palestine, and Van de Mieroop (1997) for attempts to separate uses in ancient Mesopotamian cities.

noxious and unsanitary uses first appeared in the Massachusetts Bay Colony in 1692.³ Piecemeal approaches to land use regulation continued through the nineteenth century, with the typical city ordinance setting limits on offensive uses such as tanneries and whale blubber storage (Schwieterman and Caspall, Ch. 2). The New Orleans' ordinance of 1869, which required butchering to take place down river of the city, was upheld by the Supreme Court in 1873, marking a key precedent for later jurisprudence on land use regulation specifically and civil rights more generally.⁴

While effective in limiting the locations of particularly noxious activities, the tangle of nuisance-specific policies was of limited use for effecting permanent separation of incompatible uses at the parcel level. Figure 1 is a stunning example of such a failure from Chicago's 1922 land use survey, discussed in more detail below, which shows a school surrounded by noxious uses. As technological progress allowed cities to become taller and more densely populated, the number of people who could be affected by each noxious use grew dramatically.⁵ Higher density was principally made possible by the development of steel-reinforced high-rise buildings, which first appeared in New York City and Chicago in the 1880s. Early urban reformers grew concerned by the blocking of light and creation of wind tunnels associated with the earliest skyscrapers (Hall, 2002, pp. 36-47). In response, a few cities, including Los Angeles and

³ "An Act for Prevention of Common Nuisances Arising by Slaughter-Houses, Still-Houses, Tallow Chandlers, And Carriers," Massachusetts Acts and Resolves, 1:59-60.

⁴ The City of New Orleans' 1869 ordinance required that all butchering occur at a "Grand Slaughterhouse" to be located down river of the city and operated by a corporation established by the city itself. The law was upheld by the Supreme Court in the "Slaughterhouse Cases", 83 U.S. (16 Wall.) 36 (1873). This decision established that the 14th Amendment's Privileges and Immunities Clause could not be used as a check on state interference with individual rights (Newsom, 2000).

⁵ The problem of infectious disease associated with poor sanitation infrastructure further compounded these problems (Ferrie and Troesken, 2008).

Washington D.C., set limits on maximum building height, and such height restrictions were generally upheld by the courts.⁶

Concern wasn't limited to the advent of skyscrapers, as even small apartment buildings of just two or three stories had long been viewed as a nuisance by homeowners concerned both with strains on local infrastructure and the maintenance of their homes' value.⁷ In the mind of the American homeowner, such buildings were also linked to encroachment by "undesirable" racial and ethnic groups, who were believed to pose an acute threat to home values (Grossman, 1989, p. 175). To mitigate this risk, real estate developers had used restrictive covenants as early as the first decades of the nineteenth century on tracts of houses built on the urban periphery or in suburbs (Wolf, 2008, Ch.2). These deed restrictions, passed from developer to homeowner, explicitly forbade commercial uses and, beginning in the final decades of the nineteenth century, the selling of the house to racial and religious minorities (Jones-Correa, 2000). In addition to serving as a strong legal guarantor of black exclusion, such deed restrictions encoded the notion that minority entry would harm the community generally and home values in particular (Brooks and Rose, 2013).

Racially restrictive covenants were not struck down by the Supreme Court until 1948, giving them decades to influence the demographic composition of neighborhoods, as they were effective if imperfect tools of exclusion.⁸ There were limits to their efficacy, however. Courts

⁶ Queen Victoria was also an early proponent of restrictions on building heights, complaining when her view of the Palace of Westminster was blocked by a graceless, fourteen-story block of apartments called the Queen Anne's Mansions that were built in 1888. Parliament passed the London Building Act in a few years later banning buildings taller than 100 feet. The Mansions stood until 1973, however, underscoring the limits of zoning to quickly reshape the urban landscape, regardless of who was offended by a particular structure.

⁷ The animosity towards apartments is evident in the well-known *Euclid* opinion authored by Justice Sutherland in which he referred to them as "a mere parasite, constructed in order to take advantage of the open spaces and attractive surroundings created by the residential character of the district" (272 U.S. at 394).

⁸ Kucheva and Sander use the *Shelley v. Kraemer* case to argue that racially restrictive covenants were an effective institution for preventing racial transition. Brooks (2011) argues that restrictive covenants continued to have effects

could not be relied upon to consistently enforce covenants, particularly prohibitions on commercial activity. Restrictive covenants were particularly ineffective when black families, desperate for better-quality housing, outbid whites for available homes and set off a process of racial transition that eroded the value of all homes on the block (Akbar, Li, Shertzer, and Walsh, 2019). Nonetheless, deed provisions have played a large role in American cities since their inception.⁹

Restrictive covenants were not the only tool used by homeowners and real estate developers to maintain racially homogenous neighborhoods. Informal enforcement of the color line was common in urban areas across the United States. The historical record is filled with examples of real estate agents colluding with developers, white communities threatening black families, arson and other property damage, and even mob violence (Massey and Denton, 1993). As a particularly odious example, in the city of Chicago between July of 1917 and July 1919, at least 26 bombs were exploded at isolated black homes in previous all-white locations or at the offices of the executing realtor (Tuttle, 1970). However, as the twentieth century wore on, white homeowners increasingly turned to more formal tools of exclusion and neighborhood control, particularly zoning. These concerns gave rise two distinct types of zoning, racial zoning and comprehensive zoning, each of which is central to our understanding of the link between race and land use regulation in the United States. We consider the emergence of each form of zoning in turn below.

The Rise and Fall of Segregation Ordinances

even after they were deemed unconstitutional; Sood, Speagle, and Ehrman-Solberg (2019) provide direct evidence for this hypothesis using data on racial covenants in Minneapolis.

⁹ For instance, restrictive covenants are still the primary form of land use regulation in the city of Houston (Kapur, 2004).

The arrival of a black, Yale-educated lawyer and his family on a previously all-white block of McCulloh Street prompted Baltimore to develop the country's first municipal segregation ordinance in the summer of 1910. Led by a neighborhood association that formed explicitly to prevent neighborhood racial transition, the city quickly passed the "West Ordinance," which became a model for the wave of such laws that swept across southern and border cities between 1910 and 1917.¹⁰ The ordinance forbade any African American from moving into or using as a residence a house or apartment on a city block where the majority of residences were occupied by whites. In an empty gesture of equality, the law also mandated that whites could not move onto a block with a majority "colored" presence. The next eight years saw 27 additional cities follow suit, with all but one located in southern or border states.¹¹

In recent work, Randall Walsh and Werner Troesken (2019) explore the sudden turn to local government for the enforcement of neighborhood color lines. The existing historical literature highlights increased black housing demand, driven by economic progress and new migration into urban areas, as the key force upending the previous arrangement by which racial segregation had been maintained.¹² In other words, whites turned to racial zoning ordinances to control the settlement of a fast-growing and comparatively economically ascendant black population. However, using a newly constructed database of all such segregation laws matched to census data on the location of growing African American communities, the authors find little support for this explanation.

The paper instead proposes an alternative mechanism that reflects the longstanding literature on the role of norms and private arrangements in promoting cooperation (Grief, 1993)

¹⁰ See Boger (2009) for a careful history of the passage of Baltimore's segregation ordinance.

¹¹ The lone exception was the town of Colwyn, Pennsylvania. This count comes from Troesken and Walsh (2019).

¹² See for instance Rice (1968) and Meyer (2001).

or protecting established property rights (Alston and Ferrie, 1993). Under this framework, segregation ordinances arise when private collective action – or in this case, the “unenacted law” of the South – fails.¹³ Supporting this hypothesis is empirical evidence showing that city-level adoption of a segregation ordinance was negatively associated with a city’s capacity for private, collective action, which the paper measures using participation in volunteer fire brigades and the frequency of lynching, the latter an extreme form of racially-motivated mob violence. The passing of such a law was also positively related to growth in the city’s white population, which could arguably undermine the ability of whites to coordinate the coercive behavior and threats of violence that were key to extrajudicial enforcement of neighborhood segregation. Additional analysis of ward-level voting patterns in the segregation ordinance referendum passed in Saint Louis in 1916 provides further support for the importance of white population dynamics in explaining the rise of segregation ordinances.

From their inception, racial zoning ordinances faced legal challenges. State courts in Virginia, Georgia and Kentucky found them valid while they were struck down in Maryland and North Carolina (Martin, 1934).¹⁴ Uncertainty over the legal status of such ordinances ended in 1917 with the US Supreme Court’s striking down of a Louisville, Kentucky ordinance (*Buchanan v. Warley*, 245 U.S. 60 1917). Despite their brief legal duration, these laws remain deeply ingrained in the narrative on race in America as a transparent demonstration of the attitudes on racial integration held by white individuals and their elected representatives.

The Era of Comprehensive Zoning

In contrast to narrowly-focused segregation ordinances, comprehensive zoning ordinances are, as the names suggests, comprehensive. They govern both the types of uses that

¹³ Phrase taken from Macon Telegraph October 27, 1910, page 4.

¹⁴ In the case of Maryland, the legal issues were largely related to the poorly crafted nature of the law.

are allowed at given locations as well as the form that those uses could take along dimensions such as building volume, height, and location on lot.¹⁵ The first such ordinance was adopted by New York City in 1916. Such ordinances were championed by the Wilson administration¹⁶ and passed by roughly 500 municipalities by 1925 (Mills, 1979). By 1930 a total of 1,100 municipalities had adopted some form of comprehensive zoning (Knauss, 1929).

As with segregation ordinances, the rise of comprehensive zoning is inseparable from the context within which it occurred. At this crucial moment in urban history, despite the limits of existing methods to control land use, American cities had obtained some degree of spatial organization. While there was generally more mixing of uses in large cities prior to widespread adoption of comprehensive zoning, a point we return to below, relatively high transport costs meant that heavy industry remained near wharves and railroads. Similarly, in most areas of the country, laborers and other lower-skilled workers could not afford daily public transit costs and simply lived within walking distance of their workplace. Transit infrastructure served as an important means of separating housing of different densities, with denser development located near streetcar stops and single-family homes located a few blocks away (Brooks and Lutz, 2019).

William Fischel has persuasively argued that the arrival of the automobile, with the motor truck and jitney bus following immediately thereafter, threw the existing system of land use control out of equilibrium (see Fischel, 2005, Ch. 5). Land was typically cheaper in outlying areas, providing a strong incentive for light industry and apartment buildings to move into areas that had previously contained only single-family homes. Homeowners and developers seeking to maximize the long-term value of houses they were building supported zoning ordinances that

¹⁵ See McDonald and McMillen, 2012 for a detailed description of the structure of these laws.

¹⁶ In 1921, Wilson's Secretary of Commerce Herbert Hoover set up an advisory committee on zoning that promulgated model zoning regulations (see Clingermayer, 1993).

covered the entire city as a substitute for the previous norms and informal institutions that had ensured the low-density residential character of their neighborhoods. In contrast to segregation zoning ordinances, such race-blind comprehensive zoning ordinances were deemed constitutional by the U.S. Supreme Court in 1926 (*Euclid vs. Ambler Realty*). In the ensuing decades, the Supreme Court largely declined to interfere in matters of local land use regulation, so long as policies were de jure race blind, leaving zoning under local control.

This standard story of the origins of comprehensive zoning recounted in the economics literature often overlooks the explicitly racial motivations of other city policies being debated and adopted concurrent with these ordinances. For example, Los Angeles passed an ordinance establishing industrial districts and a system for neighborhoods to petition to become exclusively residential earlier, in 1908. A notable feature of this ordinance is that laundries were banned in the newly created residential districts, which was an early instance of an ostensibly race-blind policy targeting a minority, in this case the Chinese who operated many of these establishments. However, the Chinese Exclusion Act of 1882 had virtually eliminated immigration from China, shrinking the potential threat of this group. On the other hand, the Great Migration represented a much greater threat to the racial sensibilities of northern homeowners and renters, as migration from the South would continue for decades.

When considering the introduction of comprehensive zoning, it is important to also recall that these policies were largely adopted in the immediate aftermath of the Supreme Court's decision to void racial zoning ordinances, leaving cities with only ostensibly race-neutral tools for controlling the spatial dispersion of development and demographic groups. Thus, at a time when they were undergoing immense demographic change, cities adopted comprehensive zoning ordinances that were constrained by the *Buchanan* ruling. The process of drafting and revising

zoning ordinances was controlled by white homeowners and their representatives who, for the most part, strongly desired racial homogeneity. As such, scholars across the social sciences interested in the “social origins” of zoning (Silver, 1997) have argued that comprehensive land use regulations adopted in the United States were and continue to be racist in nature.¹⁷

Investigating how city residents and governments used the policy tools at their disposal is essential to understanding the long-run impact of land use regulation, particularly on racial segregation.

The Structure of Early Comprehensive Land Use Regulation

The form of the new comprehensive zoning ordinances was shaped by Progressive Era views on planning and governance. They were typically grounded in a dual-overlay system of maps, which contained detailed technical descriptions of allowable uses, heights, setbacks, and volumes.¹⁸ The use zoning map specified districts for single-family homes, multi-family housing, commercial, and industrial uses. Use zoning was usually hierarchical, with the least restrictive districts (industrial) allowing all other uses, and single-family home districts the most restrictive. Complementing use zoning, density zoning governed allowable lot coverage, height, and aggregate volume; the most stringent restrictions on height were typically found furthest away from the downtown area. This complexity reflected the Progressive Era’s “scientific” approach to government and the specifics of the regulations reflected concerns of the ongoing City Beautiful Movement. Motivated by a mistrust of the frequently corrupt and often machine-controlled city governments of the day, the officials who drafted these ordinances also sharply

¹⁷ Rothstein (2017) and Trounstein (2018) are recent examples from law and political science, respectively.

¹⁸ The dual-map system was common, but not universal. For example, Chicago and Seattle (discussed further below) used this approach, as did Boston, Pittsburgh, and St. Louis. However, other cities (like Cincinnati, Philadelphia, and San Francisco) defined multiple districts for each use type, stratified by allowed density (as is common in modern ordinances). Unusually, New York City’s pioneering 1916 ordinance used a three-map overlay, with two separate maps for area and height restrictions.

limited bureaucratic discretion (Hirt, 2014, Ch. 6), demonstrating another key tenant of the Progressive Era's new approach to government.

Existing establishments were rarely targeted for removal in these initial zoning ordinances, even though there were often significant conflicts between newly drawn maps and land use patterns, which we document below. Non-conforming uses were typically protected by "grandfather" clauses that allowed for existing uses to continue (albeit with only limited expansions or renovations). In some cases, amortization periods of five to ten years were set, after which non-conforming uses were to be removed, but such policies were eventually deemed a failure and non-conforming uses were simply left in place (Serkin, 2009). These loopholes, along with the potential for zoning variances, have led many scholars to view zoning as reflecting existing arrangements rather than rapidly reshaping cities. While there generally exists very little quantitative work on the factors that shaped the zoning ordinances first adopted by major cities in the United States,¹⁹ one exception is McMillen and McDonald's (1999) study of a sample of blocks in Chicago, which found that zoning largely followed existing uses.

Measuring Zoning Stringency across Time and Space

Measuring the existence and stringency of zoning regulations is challenging in any period. One reason why the origins and long-run impacts of zoning have received so little attention in economics is that the construction of large datasets with the detailed, fine-grained spatial information required is costly and time consuming. A notable exception is the work by McDonald and McMillen (1993, 2002) which uses a sample of about 1000 blocks from Chicago to assess the consequences of its initial comprehensive zoning ordinance, adopted in 1923. In our

¹⁹ However, contemporary urban economists have pointed out that zoning is itself a policy outcome. Wallace (1988) and Munneke (2005) find that zoning evolves to reflect the highest-value use of land and Davidoff (2015) has pointed out that zoning ordinances cannot possibly be treated as exogenous because their adoption is correlated with many local factors that determine productivity growth.

own work, we digitized the entire 1923 Chicago zoning ordinance, including both use and density layers (2016, 2018). The city also undertook a land use survey at the lot level in 1922, immediately prior to drawing up this zoning ordinance, which we also digitized. While there exist several other digitized historical cross sections of zoning ordinances²⁰, to our knowledge, consistently collected panel datasets of historical land use regulations do not exist. However, survey-based indices of zoning stringency have been collected in recent years, most prominently Gyourko, Saiz, and Summers (2008).²¹

Evidence from Chicago and Seattle on the Racial and Ethnic Dimensions of Zoning Laws

We began working on the origins of comprehensive zoning as part of a larger project on the origins of segregation in northern cities. Using fine-grained geospatial demographic data (Shertzer, Walsh, and Logan, 2015) together with a newly digitized version of Chicago's 1923 ordinance allowed us to assess the relationship between land use regulation and demographics at a fine spatial scale. Using data for the entire city, we ask if the racial and ethnic composition of neighborhoods also affected local zoning stringency (Shertzer, Twinam, and Walsh, 2016). The key advantage of our approach is that we can observe land use at the lot level from a pre-zoning survey from 1922 (Chicago Zoning Commission, 1922). Our main empirical strategy estimates the impact of minority populations on zoning outcomes, conditional on existing land use and geographic factors. Importantly, we could control for ex ante density and mixed uses in minority

²⁰ Tate Twinam digitized the 1923 and 1957 Seattle ordinances, which had a similar structure, in his study of the evolution of land use and zoning in that city (2018). Yilin Wu digitized the New York City ordinance of 1961 to study the relationship between zoning and segregation (2019). The earliest state-level cross section that we are aware of is Evenson and Wheaton (2003), who digitized the zoning ordinance for every jurisdiction in Massachusetts in 1999. Jennifer Schuetz (2008) constructed a particularly detailed survey for the Boston metro area a few years later.

²¹ One drawback of these surveys is that they do not contain systematic information about zoning bylaws before the 1990s and rarely have spatial information from within municipalities. In addition, surveys may yield inaccurate or inconsistent measures depending on the experience of the official tasked with filling them out (Gyourko and Molloy, 2015; Lewis and Marantz, 2019).

neighborhoods, which allows us to disentangle differential zoning treatment from the disproportionate settlement of minorities in areas with denser development and non-residential uses (Been and Gupta, 1997). We find that both first-generation immigrants and black migrants from the South were targeted for the most permissive use zoning, and these effects were quite large given the relative scarcity of land zoned for all uses, including industrial. These results are echoed by Twinam’s (2018) study of Seattle, which found evidence of similar discrimination against African- and Chinese-Americans, who saw their neighborhoods saddled disproportionately with industrial zoning.

Looking beyond the placement of nuisances, we also found evidence of an early form of “exclusionary” zoning under which black neighborhoods were drawn into districts allowing higher density development.²² For European immigrants, the relationship was reversed, and neighborhoods with white ethnics were more likely to be zoned for lower density relative to neighborhoods with white native-born populations, all else equal.

We also considered the relative importance of demographics, as compared with other more commonly-cited determinants of zoning, in determining the overall pattern of use zoning. Because first-generation immigrants and African-Americans were largely absent from sizeable portions of the city, race and ethnicity provide limited power for explaining use zoning city wide. Focusing attention instead on the areas of the city near black neighborhoods, we find the predictive power of race and ethnicity is pronounced. Specifically, these demographic factors are roughly half as important as each of the most important factors taken separately – geography, pre-existing land uses, or transportation networks – in predicting zoning for manufacturing use.

²² We focused on the margin between the two lowest levels of density zoning, where the greatest scope for disparate treatment would be found. The three highest levels of density zoning were located mostly in the downtown area. See paper for details.

These results provide strong empirical support for the notion that racial considerations influenced the earliest zoning ordinances, and that de jure race-blind land use regulations were implemented to a discriminatory effect. In addition, our finding that neighborhood-level demographics mattered for both density and use zoning stands in contrast to studies of minimum lot sizes specifically, and land use regulations in general, which highlight existing and historic density as key zoning drivers (Evenson and Wheaton, 2003; Glaeser and Ward, 2009). Thus, racial discrimination in zoning may have persisted across the decades not by explicitly preventing migration to new areas, but rather by allowing uncontrolled development in African-American neighborhoods while white neighborhoods reaped the economic benefits of low-density, purely residential zoning.

Evidence from Chicago and Seattle on Zoning's Impacts over the Long Term

A crucial related question is how persistent and influential early zoning ordinances were in shaping current urban geography, particularly relative to the market forces that have attracted a great deal of attention in economics.²³ Zoning has conventionally been understood by economists as primarily endogenous (Wallace, 1988 and Munneke, 2005), reflecting the current optimal use of land, or at most as having a short-run effect on land prices (McDonald and McMillen, 1998 and Zhou et al., 2008). This consensus stands in stark contrast to the view held by other urban social scientists, who see zoning as a crucial tool of racial exclusion (see Trounstein, 2019, Ch. 8). However, the literature on the long-run impacts of zoning is based on a comparatively thin empirical basis, primarily because scholars have only very recently digitized historical zoning ordinances.

²³ For instance, see Duranton and Puga (2015), Combes and Gobillon (2015), and Redding and Turner (2015).

Beyond the data, a key challenge in understanding the long-run impacts of zoning is that in most cities, zoning and land use have been evolving together for nearly a century, making it difficult to assess how important regulations are in determining where people live and uses are located. We take a unique approach in our paper on the long-term impacts of Chicago's first zoning ordinance (2018). Specifically, we link the land use and zoning from Chicago in the 1920s to contemporary block-level data on the location of manufacturing activity, commercial uses, residential areas, population density and polluting facilities. This paper, along with Twinam's (2018) study of Seattle, are to our knowledge the only research to assess the impact of comprehensive zoning from its establishment to the present.²⁴

Our analysis uses standardized multiple-partial regression methods to evaluate the importance of zoning in shaping contemporary outcomes relative to initial land use, transportation networks, geography, and demographics. We find that 1923 zoning and pre-existing land uses are of comparable importance in determining present-day land use, and that both have a considerably larger impact than transportation networks, geography, or demographics. Twinam (2018) also found large long-run effects of zoning relative to these other factors in Seattle. These findings are particularly striking given the primacy of transportation and geography in typical urban models, suggesting a more prominent role for land use regulation in shaping cities than is suggested by the current consensus.

The efficacy of zoning in Chicago is illustrated by Figures 2 and 3 (adapted from Shertzer, Twinam, and Walsh, 2018) that show how, over the long-run, relatively disjoint patterns of commercial and industrial development became more compact as these types of uses concentrated in locations for which they were zoned. Specifically, Figure 2 shows a substantial

²⁴ Readers interested in the long-run impacts of zoning should see Twinam's (2020) review article comparing the cases of Chicago and Seattle.

number of industrial uses located in neighborhoods far from the lake, river, or railroads. The 1923 ordinance restricted industrial activity to these areas, and by 2005 most isolated industrial uses in areas not zoned for such uses had disappeared. Similarly, Figure 3 shows that commercial uses were essentially everywhere in the developed parts of the city in 1922, but the 1923 zoning ordinance restricted commerce to be along major streets. After eighty years, commercial uses exhibit a strikingly more grid-like pattern, strongly suggesting that zoning was effective in removing such establishments from primarily residential streets.

The results from this work show that over the long run, zoning can have a major impact on where people live and work, and it suggests that discrimination in the development of land use regulations could have persistent impacts. To our knowledge, there exists no well-identified empirical work in economics directly addressing the question of how important race-blind zoning ordinances were in shaping patterns of residential segregation within cities or across metro areas over the long term. We see this question as the most important for future work in urban economic history related to land use regulation.

Zoning in More Recent History and Directions for Future Work

The postwar era saw continued black migration into cities and conflicts around the color line. As other tools for maintaining segregation have been eliminated, particularly with the Fair Housing Act of 1968, scholars outside of economics have argued that zoning has become an increasingly important tool of racial exclusion (for instance, see Rothstein, 2017, Ch. 3), particularly so given the explosion of housing costs in central cities, which has led to a push for higher-density development. Many have argued that high-income, largely white neighborhoods have used zoning to block denser development, diverting it towards lower-income, more diverse neighborhoods. This diversion may have had the effect of fueling rising housing costs in these

neighborhoods and generating displacement, while at the same time preventing poor and minority city dwellers from locating in high-opportunity neighborhoods.²⁵ However, much work remains to be done in establishing causal relationships between zoning, segregation, and sorting. At the same time, the suburbs experienced substantial growth linked to midcentury white flight from the urban core. The adoption of exclusionary zoning in the suburbs may have served to "pull up the ladder," further entrenching segregation. Racially neutral zoning ordinances and barriers to development, even those that aim to exclude the poor, have survived legal challenges, most prominently in the 1975 case *Warth v. Seldin*.

The debate in economics to date has largely centered instead on the tradeoff between "homevoters," who block housing construction in part to reduce pecuniary externalities and maximize the value of their properties (Fischel, 2001), and the reduced economic opportunity associated with limiting dense development in the most productive areas of the country (Glaeser, Gyourko, and Saks, 2006). Economists have pointed out that one of the primary assumptions of the homevoter perspective – that smaller dwellings free ride off the tax base of rich jurisdictions – does not appear to hold in many cases (Babcock and Bosselman, 1963 and Gallagher, 2019), potentially suggesting a racially exclusive motivation for the adoption of ordinances that block multi-family dwellings. Even in situations where density zoning is motivated purely by the desire to protect residential property values, the black-white wealth gap (partially driven by neighborhood differentials in housing price growth) may nonetheless lead to racially disparate outcomes (Flippen, 2004). Thus, an important area for future research in economics is

²⁵ Pendall (2000) makes such an argument with respect to low density zoning and building permit caps, finding that more restrictive versions of these policies are associated with lower African-American and Hispanic population shares. His paper acknowledges the difficulty of establishing a causal relationship between zoning and the location of minority neighborhoods without historical data on the evolution of these factors.

reconciling the homevoter vs. opportunity debate with the economic history of land use regulation, particularly clarifying the role of maintaining racial segregation in these laws.

Relatedly, the environmental justice literature highlights the disproportionate exposure of black and minority communities to environmental hazards. Some scholars have argue that this differential is the result of explicit intent to steer environmental disamenities to minority neighborhoods, while others focus on sorting behavior by lower-income households towards low-cost, low-amenity neighborhoods (Been and Gupta, 1997 and Banzhaf and Walsh, 2013). Clarifying the importance of these various forces is essential for reaching a broad consensus on how zoning has shaped where people live and work, as well as how to design policies to reduce disparities and segregation.

Deepening our understanding of the role of zoning over the long term will require creativity and resources. An additional challenge for work after World War II is the increasing importance of suburbanization and sorting between municipalities in a metro area. Existing historical data on zoning is limited to individual large cities, making it impossible to conduct analyses of the impact of zoning across metropolitan areas over time. Future work should seek to examine the co-evolution of zoning in major cities and their surrounding suburbs, with the aim of understanding how these restrictions shaped demographic changes.

Our experience suggests a road map for addressing these questions on how zoning ordinances were adopted and came to shape the evolution of cities. An important step is for economists to engage with the central role that other social science disciplines have placed on race in the study of land use regulation and zoning. Such engagement presents a challenge for empirical economists, as the difficulty of disentangling race, wealth, and income in empirical work is multiplied by the need to overcome the endogeneity problems inherent in the co-

evolution of zoning and land use. Thus, it is important that our discipline reward the creation and digitization of new data sources that can be used to improve identification and broaden the range of questions that scholars studying zoning can ask. Finally, we emphasize that a historical perspective is essential for understanding the origins and long-run impacts of land use regulation, particularly as it relates to racial segregation.

References

- Akbar, Prottoy A., et al. *Racial segregation in housing markets and the erosion of black wealth*. No. w25805. National Bureau of Economic Research, 2019.
- Alston, Lee J., and Joseph P. Ferrie. "Paternalism in agricultural labor contracts in the US South: Implications for the growth of the welfare state." *The American economic review* (1993): 852-876.
- Banzhaf, H. Spencer, and Randall P. Walsh. "Segregation and Tiebout sorting: The link between place-based investments and neighborhood tipping." *Journal of Urban Economics* 74 (2013): 83-98.
- Babcock, Richard F., and Fred P. Bosselman. "Suburban Zoning and the Apartment Boom, 111 U." *Pa. L. Rev* 1040 (1963): 1060-61.
- Been, Vicki, and Francis Gupta. "Coming to the nuisance or going to the barrios? A longitudinal analysis of environmental justice claims." *Ecology law quarterly* 24.1 (1997): 1-56.
- Boger, G. (2009). The Meaning of Neighborhood in the Modern City: Baltimore's Residential Segregation Ordinances, 1910—1913. *Journal of Urban History*, 35(2), 236–258. <https://doi.org/10.1177/0096144208327915>
- Brooks, Leah, and Byron Lutz. "Vestiges of Transit: Urban Persistence at a Microscale." *Review of Economics and Statistics* 101.3 (2019): 385-399.
- Brooks, Richard RW. *Saving the Neighborhood*. Harvard University Press, 2013.
- Brooks, Richard RW, and Carol M. Rose. "Saving the Neighborhood: Racially Restrictive Covenants." *Law, and Social Norms* 19 (2013).
- Clingermayer, James. "Distributive politics, ward representation, and the spread of zoning." *Public Choice* 77.4 (1993): 725-738.
- Combes, Pierre-Philippe, and Laurent Gobillon. "The empirics of agglomeration economies." *Handbook of regional and urban economics*. Vol. 5. Elsevier, 2015. 247-348.
- Cutler, David M., Edward L. Glaeser, and Jacob L. Vigdor. "The rise and decline of the American ghetto." *Journal of political economy* 107.3 (1999): 455-506.
- Davidoff, Thomas. "Supply Constraints Are Not Valid Instrumental Variables for Home Prices Because They Are Correlated with Many Demand Factors." *Critical Finance Review* 5.2 (2016): 177-206.
- Durantón, Gilles and Diego Puga. "Chapter 8 - Urban Land Use." Gilles Durantón, J. Vernon Henderson and William C. Strange, Eds, *Handbook of Regional and Urban Economics*, 2015, Volume 5, pp. 467-560.
- Evenson, Bengte, et al. "Local variation in land use regulations [with Comments]." *Brookings-Wharton Papers on Urban Affairs* (2003): 221-260.

- Ferrie, Joseph P., and Werner Troesken. "Water and Chicago's mortality transition, 1850–1925." *Explorations in Economic History* 45.1 (2008): 1-16.
- Fischel, William A. *The homevoter hypothesis*. Harvard University Press, 2001.
- Fischel, W. A. (2004). An Economic History of Zoning and a Cure for its Exclusionary Effects. *Urban Studies*, 41(2), 317–340. <https://doi.org/10.1080/0042098032000165271>
- Fischel, William A. *Zoning rules!: The economics of land use regulation*. Lincoln Institute of Land Policy, 2015.
- Flippen, Chenoa. "Unequal returns to housing investments? A study of real housing appreciation among black, white, and Hispanic households." *Social Forces* 82.4 (2004): 1523-1551.
- Gallagher, Ryan M. "Restrictive Zoning's Deleterious Impact on the Local Education Property Tax Base: Evidence from Zoning District Boundaries and Municipal Finances." *National Tax Journal* 72.1 (2019): 11-1.
- Ganong, Peter, and Daniel Shoag. "Why has regional income convergence in the US declined?" *Journal of Urban Economics* 102 (2017): 76-90.
- Glaeser, Edward L., Joseph Gyourko, and Raven E. Saks. "Urban growth and housing supply." *Journal of economic geography* 6.1 (2006): 71-89.
- Glaeser, Edward L., and Bryce A. Ward. "The causes and consequences of land use regulation: Evidence from Greater Boston☆." *Journal of Urban Economics* 65 (2009): 265-278.
- Greif, Avner. "Contract enforceability and economic institutions in early trade: The Maghribi traders' coalition." *The American economic review* (1993): 525-548.
- Grossman, James R. *Land of hope: Chicago, black southerners, and the great migration*. University of Chicago Press, 1991.
- Gyourko, Joseph, and Raven Molloy. "Regulation and housing supply." *Handbook of regional and urban economics*. Vol. 5. Elsevier, 2015. 1289-1337.
- Gyourko, Joseph, Albert Saiz, and Anita Summers. "A new measure of the local regulatory environment for housing markets: The Wharton Residential Land Use Regulatory Index." *Urban Studies* 45.3 (2008): 693-729.
- Hakim, Besim S. "Julian of Ascalon's treatise of construction and design rules from sixth-century Palestine." *Journal of the Society of Architectural Historians* 60.1 (2001): 4-25.
- Hall, Peter. *Cities of tomorrow: An intellectual history of urban planning and design since 1880*. John Wiley & Sons, 2002.
- Hart, John F. "Colonial land use law and its significance for modern takings doctrine." *Harvard Law Review* (1996): 1252-1300.
- Hirt, Sonia A. *Zoned in the USA: The origins and implications of American land-use regulation*. Cornell University Press, 2015.

- Hsieh, Chang-Tai, and Enrico Moretti. "Housing constraints and spatial misallocation." *American Economic Journal: Macroeconomics* 11.2 (2019): 1-39.
- Jones-Correa, Michael. "The origins and diffusion of racial restrictive covenants." *Political Science Quarterly* 115.4 (2000): 541-568.
- Kapur, Teddy M. "Land use regulation in Houston contradicts the city's free market reputation." *Envtl. L. Rep. News & Analysis* 34 (2004): 10045.
- Knauss, Norman L. *Zoned Municipalities in the United States*. Division of Building and Housing, Bureau of Standards, 1933.
- Lewis, Paul G., and Nicholas J. Marantz. "What planners know: Using surveys about local land use regulation to understand housing development." *Journal of the American Planning Association* 85.4 (2019): 445-462.
- Martin, Arthur T. "Segregation of Residences of Negroes." *Mich. L. Rev.* 32 (1933): 721.
- Massey, Douglas S., and Nancy A. Denton. *American apartheid: Segregation and the making of the underclass*. Harvard University Press, 1993.
- McDonald, John F., and Daniel P. McMillen. "Land values, land use, and the first Chicago zoning ordinance." *The Journal of Real Estate Finance and Economics* 16.2 (1998): 135-150.
- McDonald, John F., and Daniel P. McMillen. "The economics of zoning." *The Oxford Handbook of Urban Economics and Planning*. Oxford University Press, 2012.
- McMillen, Daniel P., and John F. McDonald. "Could zoning have increased land values in Chicago?" *Journal of Urban Economics* 33.2 (1993): 167-188.
- McMillen, Daniel P., and John F. McDonald. "Land use before zoning: The case of 1920's Chicago." *Regional Science and Urban Economics* 29.4 (1999): 473-489.
- McMillen, Daniel P., and John F. McDonald. "Land values in a newly zoned city." *Review of Economics and Statistics* 84.1 (2002): 62-72.
- Meyer, S. G. (2000). *As long as they don't move next door: Segregation and racial conflict in American neighborhoods*. Rowman & Littlefield.
- Mills, David E. "Segregation, Rationing and Zoning." *Southern Economic Journal* (1979): 1195-1207.
- Munneke, Henry J. "Dynamics of the urban zoning structure: An empirical investigation of zoning change." *Journal of Urban Economics* 58.3 (2005): 455-473.
- Newsom, Kevin Christopher. "Setting Incorporationism Straight: A Reinterpretation of the Slaughter-House Cases." *The Yale Law Journal* 109.4 (2000): 643-744.
- Redding, Stephen J. and Matthew A. Turner. "Chapter 20 - Transportation Costs and the Spatial Organization of Economic Activity." Gilles Duranton, J. Vernon Henderson and William C. Strange, eds. *Handbook of Regional and Urban Economics*, 2015, Volume 5, pp. 1339-1398.

- Rice, Roger L. "Residential segregation by law, 1910-1917." *The Journal of Southern History* 34.2 (1968): 179-199.
- Rothstein, Richard. *The color of law: A forgotten history of how our government segregated America*. Liveright Publishing, 2017.
- Schuetz, Jenny. "No Renters in My Suburban Backyard: Land Use Regulation and the Rental Housing Market in Massachusetts." *Furman Center for Real Estate and Urban Policy, New York University, New York* (2008).
- Schwieterman, Joseph P., and Dana M. Caspell. *The politics of place: a history of zoning in Chicago*. Lake Claremont Press, 2006.
- Serkin, Christopher. "Existing Uses and the Limits of Land Use Regulations." *NYUL Rev.* 84 (2009): 1222.
- Shertzer, Allison, Tate Twinam, and Randall P. Walsh. "Race, ethnicity, and discriminatory zoning." *American Economic Journal: Applied Economics* 8.3 (2016): 217-46.
- Shertzer, Allison, Randall P. Walsh, and John R. Logan. "Segregation and neighborhood change in northern cities: New historical GIS data from 1900–1930." *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 49.4 (2016): 187-197.
- Shertzer, Allison, Tate Twinam, and Randall P. Walsh. "Zoning and the economic geography of cities." *Journal of Urban Economics* 105 (2018): 20-39.
- Silver, Christopher. "The racial origins of zoning in American cities." *Urban planning and the African American community: In the shadows* 23 (1997): 23-39.
- Sood, Aradhya, William Speagle, and Kevin Ehrman-Solberg. "Long Shadow of Racial Discrimination: Evidence from Housing Covenants of Minneapolis." *SSRN Working Paper*, 2019.
- Stephenson, G. T. (1910). *Race distinctions in American law*. D. Appleton.
- Teaford, Jon C. *City and suburb: The political fragmentation of metropolitan America, 1850-1970*. Johns Hopkins University Press, 1979.
- Troesken, Werner, and Randall Walsh. "Collective Action, White Flight, and the Origins of Racial Zoning Laws." *The Journal of Law, Economics, and Organization* 35.2 (2019): 289-318.
- Trounstine, Jessica. *Segregation by design: Local politics and inequality in American cities*. Cambridge University Press, 2018.
- Tuttle Jr, W. M. (1970). "Contested neighborhoods and racial violence: Prelude to the Chicago riot of 1919." *The Journal of Negro History*, 55(4), 266-288.
- Twinam, Tate. "The long-run impact of zoning: Institutional hysteresis and durable capital in Seattle, 1920–2015." *Regional Science and Urban Economics* 73 (2018): 155-169.

Twinam, Tate. "The Long-Run Impact of Zoning in US Cities." *Measuring the Effectiveness of Real Estate Regulation*. Springer, Cham, 2020. 35-59.

Van de Mieroop, Marc. *The ancient Mesopotamian city*. Clarendon Press, 1997.

Wallace, Nancy E. "The market effects of zoning undeveloped land: Does zoning follow the market?" *Journal of Urban Economics* 23.3 (1988): 307-326.

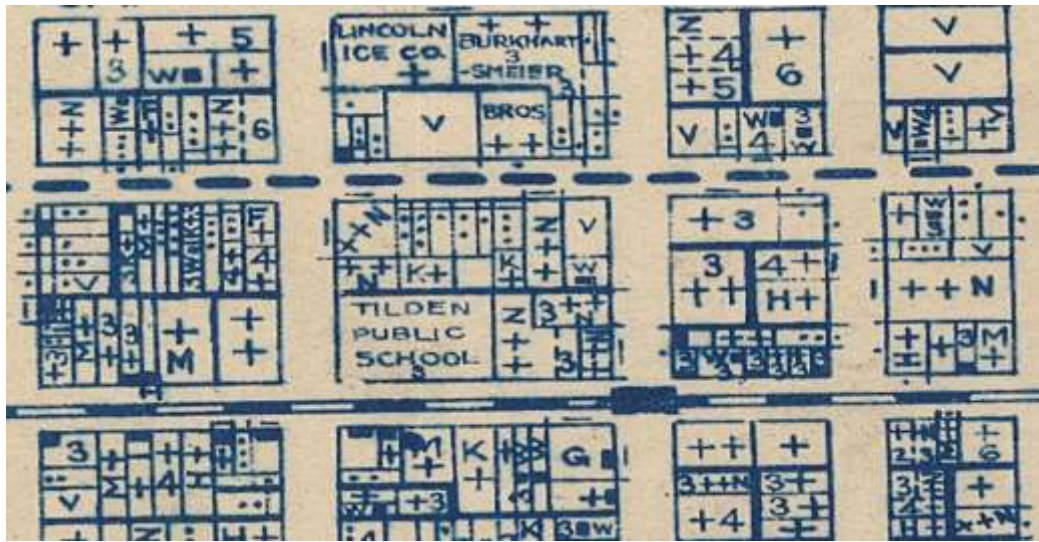
Wolf, Michael Allan. *The Zoning of America: Euclid v. Ambler*. Univ. Press of Kansas, 2008.

Woodward, Comer Vann, and William S. McFeely. *The strange career of Jim Crow*. Oxford University Press, USA, 2002.

Wu, Yilin. "The Impact of Density Zoning on Neighborhood Segregation: Evidence from Mid-Century New York City." Manuscript, 2019.

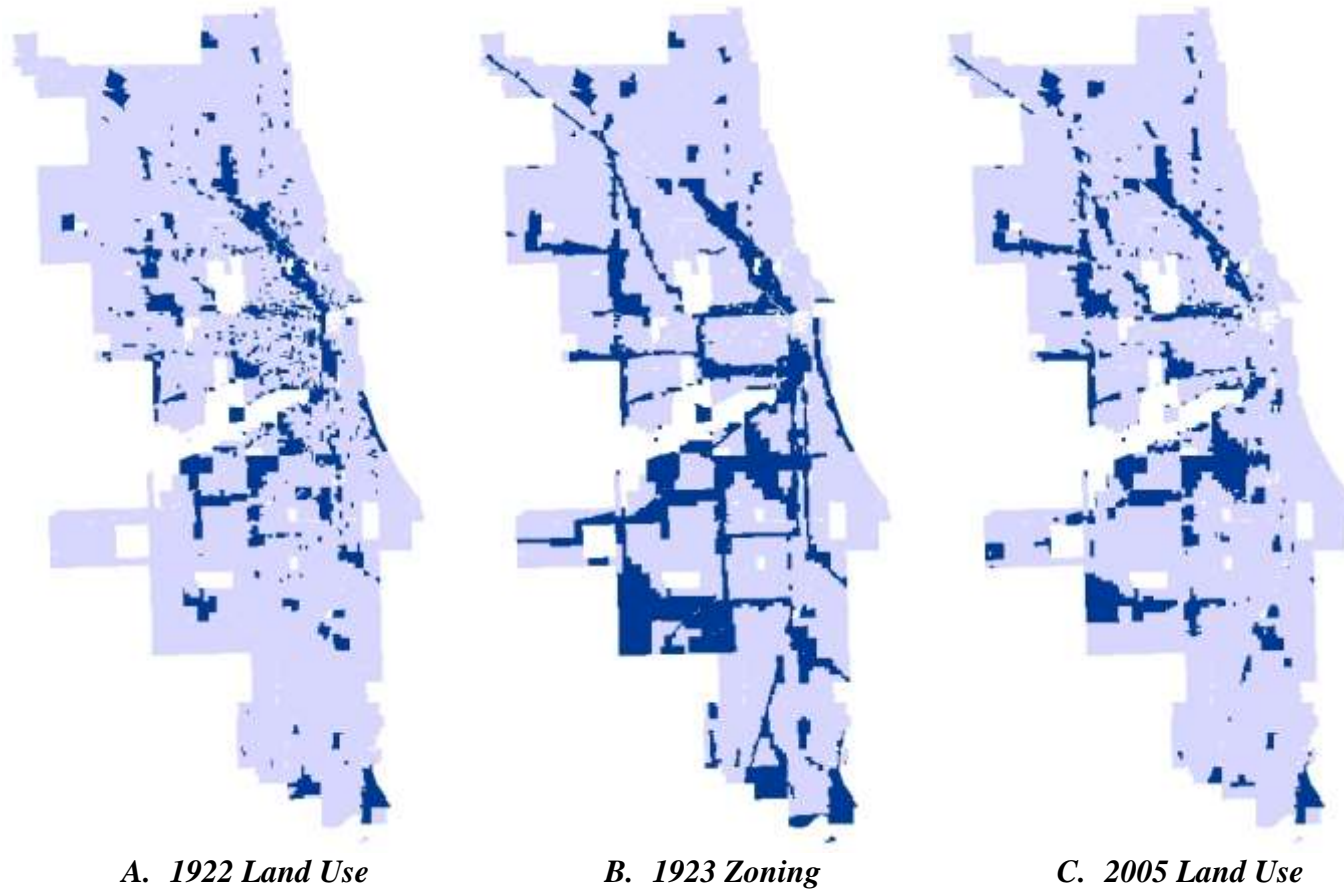
Zhou, Jian, Daniel P. McMillen, and John F. McDonald. "Land values and the 1957 comprehensive amendment to the Chicago zoning ordinance." *Urban Studies* 45.8 (2008): 1647-1661.

Figure 1. A Sample of Chicago's Land Use Survey of 1922



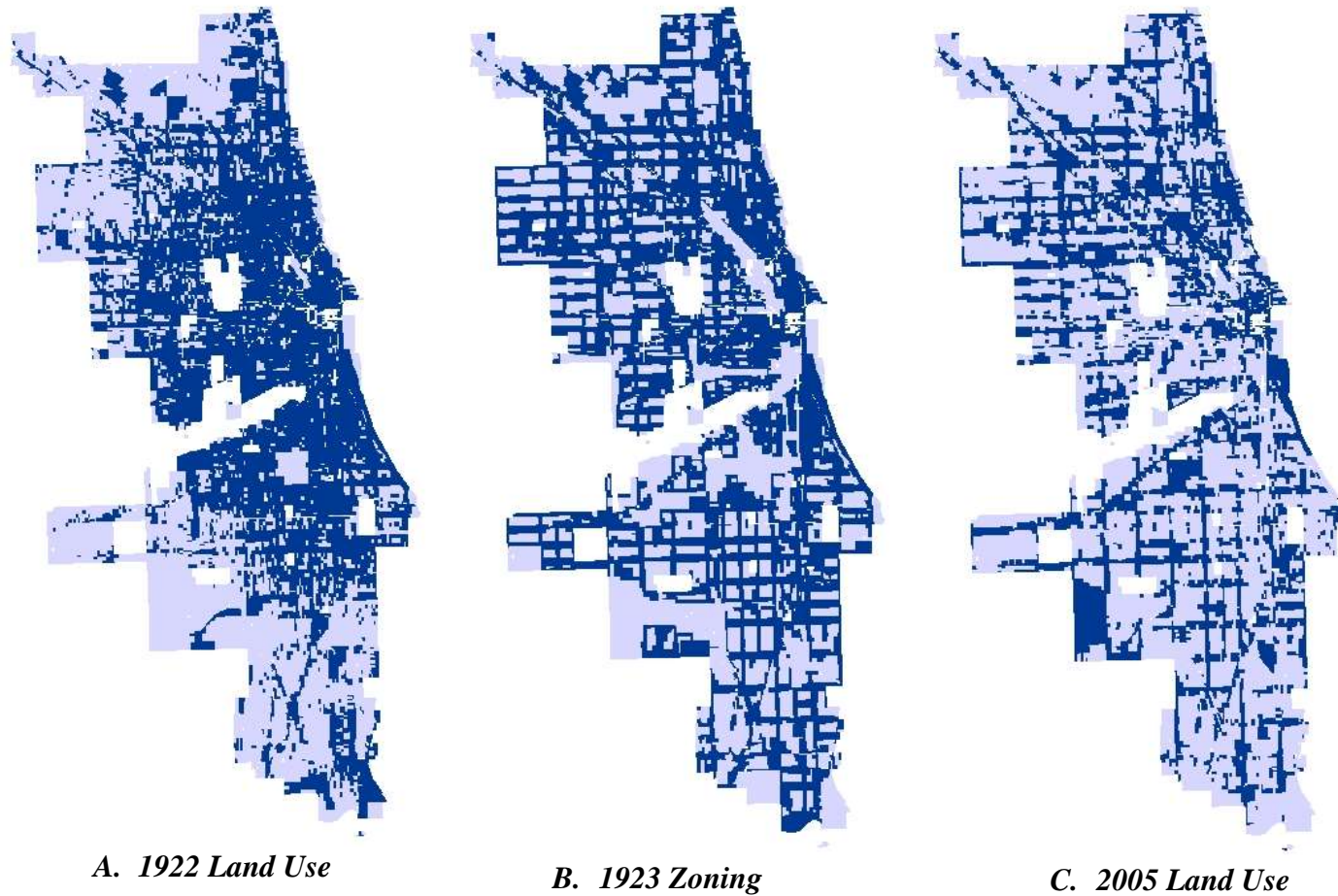
Notes: A portion of the 1922 land use survey map created by the Chicago Zoning Commission. These blocks are located just across the Chicago River to the west of the downtown. Numbers indicate building heights in stories. Black squares within parcels indicate commercial uses; letters sometime accompany these to indicate a specific commercial activity. V indicates a vacant lot/building. Letters followed or preceded by a single + indicate light industrial uses. Letters preceded by ++ indicate heavier industrial uses; in particular, ++N indicates uses which “by reason of excessive noise, odor, fumes, gases, etc., affect the adjacent territory.”

Figure 2. Distribution of Industrial Land Use in 1922 and 2005 and Zoning for Industry in 1923



Notes: This image contrasts 1922 land use with 1923 zoning and 2005 land use. Blue areas in panel A contained industrial uses prior to zoning. Blue areas in panel B were zoned for industry. Blue areas in panel C contained industry in 2005. From Shertzer, Twinam, and Walsh (2018).

Figure 3. Distribution of Commercial Land Use in 1922 and 2005 and Zoning for Commerce in 1923



Notes: This image contrasts 1922 land use with 1923 zoning and 2005 land use. Red areas in panel A contained commercial uses prior to zoning. Red areas in panel B were zoned for commercial use. Red areas in panel C contained commercial uses in 2005. From Shertzer, Twinam, and Walsh (2018).